COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

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Portent of the Report on Coal Stocks

COAL producers needs must look deep into the stock report of the Geological Survey last week to find comfort. The consumers are told by their Washington organization, the United States Chamber of Commerce, to consider the soft-coal crisis over and to go into the market for winter supplies. The Chamber says the trouble is over. It is understood that the Interstate Commerce Commission is actively considering the lifting of the service order that gives coal preference and priority in transportation and in the use of cars. For weeks the production of soft coal has been increasing and the price declining. Stocks are now at a point above 35,000,000 tons, sufficient for thirty days on the average.

There are several things that will prevent the coal market from sinking to the deadly monotony of two years ago. One, and the most important, is that these millions of tons of reserves are not equally distributed, even as they have been in normal times in the past. The railroads are particularly short of stocks. Their supply on Oct. 1 is reported as 5,450,000 tons, a 15-day supply, or only half the normal 30-day reserve at this time of the year. Locally this will have an important bearing on the situation as soon as zero weather, long delayed in the northern areas, arrives. Nothing plays hob with coal distribution like confiscation by the railroads when they have to resort to such tactics for protection.

Current market reports record the steady demand for domestic sizes and bear out the conclusion of the Survey that retail dealers have low stocks. For the past month lump coal has been at a premium and the resultant sizes of steam coal are in oversupply. This situation will not be cleared up until industrials, particularly in the regions adjacent to the mines in the Middle West, take it upon themselves to resume stocking. Every indication is that the pressure for domestic coals will continue heavy throughout the winter. Railroad-fuel demands in this territory, however, will curtail the supply of lump that can be applied on this business.

The iron and steel industry, requiring a large volume of special coal and with but half a month's reserve on Oct. 1, which by the way is not far below normal, is working with renewed activity. Though reserves of coal are not dangerously low, the stocks of byproduct coke on hand are reported as but one-fourth those in March and it seems apparent that there can be no falling off in this important market. With respect to steam coal New England has been in a comfortable position all year and it is now apparent that the Northwest will have little trouble on that score this winter.

On the whole the feeling of relief that the crisis is past is warranted. A month's average reserve is insurance against a panic market, but it is at least 10,000,000 tons below the normal supply in the hands of consumers at this time of year. Offsetting the inequality of its distribution is the fact that the most distant markets are best supplied, which means that acute local trouble will be largely confined to consumers near the mines and thus able to get coal by rail without delay save when storms interfere. Severe weather is inevitable. Industry is gaining in activity. There is no likelihood that the coal market will fall flat this winter. Healthy activity will be better for all than a runaway market.

Making Strikes Unnecessary

WITH an April strike hanging over its head, the country is told by the United Mine Workers that the causes of strikes lie between the arrogance of mine officials and the refusals of the operators to meet the miners in the negotiation of wage settlements. In the second of its communications to the Coal Commission in answer to a general request for information on the causes of strikes and suggestions for their prevention, the committee of the miners' union urges complete unionization of the coal fields as the only true solution of the coal problem. The miners point out that the coal miner is the best striker in the world and say that they desire not that strikes be made impossible, but unnecessary.

It is not conceivable that the union in presenting these two communications to the commission has any idea that they will be taken seriously. These "releases" are too obviously releases for the press—the bid for support of the press in the suggestion that newspaper reporters be used as investigators is evidence in point. The commission has too patent an opportunity for checking the loose statements of the miners to cause any concern to those who desire that the facts be known.

In respect to the last two general strikes the commission may conceivably go behind the record and concern itself with the basic causes; it may not content itself with the loose assertion that the miners had to strike because they could not learn what wage they would be offered when their contract expired. There is more than the turning of a phrase in the statement of the bituminous-coal operators that absentee control of mine labor is a prominent factor in general strikes. But then the overlordship of labor exercised by John L. Lewis is more a thing to be envied by the soft-coal operators than otherwise. The solution of the labor problem here is a control of that leadership in the public interest and not its complete abolition. It is fatuous to suppose that the union among the coal-mine workers can be eliminated.

Since the public, and hence the Coal Commission, is chiefly interested in strikes as they affect the supply and price of coal, local strikes are of minor importance. Every industry that is organized has petty strikes, the building trades being a particular case in point. Dis-

putes at individual mines are common, and all too frequently these end in strikes in contravention of the contract between the company and the men. The United Mine Workers are maintaining that the officials of the coal companies are responsible for these outbursts. The fact of the matter is that the very nature of the relations between the producing company and the contract miner is such that constant adjustment is required in respect to matters of payment for work. No contract has ever been written that makes provision for every contingency. The foreman who is responsible for results and costs is no more anxious to get work done as cheaply as possible than is the miner to get all he can for what he does.

We venture to say that the promotion of a miner to foreman changes his viewpoint only and not his human nature. The complaint of the United Mine Workers that petty strikes are solely the result of arrogance on the part of minor officials is a one-sided statement. It is not borne out by the facts. Time and experience in the coal mines have produced a system of carrying upward the petty troubles between miner and underofficial. It is set forth in the contract, and in most instances conciliation prevents open rupture and a strike.

Where local strikes become common, as in the Middle West in recent years, there must be some underlying cause beyond the mere personalities of the mine officials. Plainly enough the irresponsibility of the miners toward their contracts has been increasing. There have been notorious but comparatively rare instances where individual operators have violated the contract by paying bonuses over the agreed scale of wages. In general, however, it is the union miner who in recent years has shown the greatest contempt for his contract, and until he can be made to respect his obligations in full, and not at his convenience, there will be local as well as general strikes.

Investigating Profits of Coal Industry for Last Ten Years

IN FRAMING the act under which the coal commission is proceeding Congress said that the profits of the coal industry for the last *ten years* should be investigated. The coal industry, particularly the bituminous-coal men, should be thankful that ten years and not five was specified. On the whole the last five years have been the most profitable ever enjoyed by the coal industry. They have, furthermore, been the only five-year period in which the coal operators had any real idea of costs and profits. Prior to the war the coal company that had a real set of books on which were charged more than actual out-of-pocket expenses was an exception. Depletion, and in particular depletion of leaseholds, and depreciation were unknown accounts, little understood and, for that reason, generally neglected.

The commission has no choice in the matter of calling on the coal companies for a ten-year record, for the law says that it shall be done. The coal companies should be keen on giving that record. They should spare no expense in putting their books for the entire period on a comparable basis, setting up accounts for depletion and depreciation and other omitted items in the earlier years. If they fooled themselves ten years ago as to what they were making on their operations that is no reason for perpetuating the error. That no charge was made for depreciation in the earlier part of that period on the accounts as then kept does not mean that that figure did not exist as a charge.

The auditors and bookkeepers of every company should at once begin a study of the old records and be prepared to give the commission these reports when it calls for them, as it must. To look over the records of the past will cause much painful reminiscing but it were well that the facts be known.

Mine Transportation

AS THE mine hauls lengthen, the business of mining more and more approaches that of railroading. Those who realize it earliest will profit most from that knowledge. The railroads have failed because they have not been kept in condition. The mines accordingly have suffered a shortage in car supply. Conditions are little better below ground. Car supply at the face is short because the underground railroads have been allowed to run down and are inadequate.

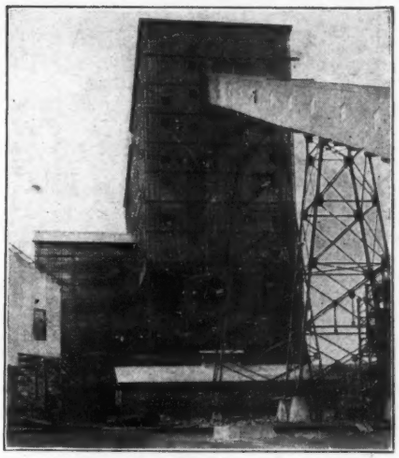
It may yet be that we shall see roads ten and more miles long with separate transportation officials. This arrangement will be the only way of giving transportation its due emphasis. Mines already have hauls four to five miles long; there may be some even longer. As much as ten years back there was a mine in Wyoming having a five-mile haul. There are some in central Pennsylvania equally long. It would be interesting to get figures on this subject.

What is being done to meet these difficult problems? One company, the Cambria Steel Co., has laid 70-lb. rail and introduced a 35-ton locomotive. Another, suddenly waking up to the idea that its transportation problem overshadowed that of mining, replaced its light rail with rail of like weight to that of the mine to which reference has been made. Some of the anthracite mines are using limestone ballast. Other companies are introducing a bedding of field stone. Many old stone fences in farming and mining regions have already found their way underground. Train dispatching is being introduced, and cars are being made having spring draft rigging and even axles with spring boxings. Some companies no longer wait till cars are ditched to examine them but keep them under constant inspection. Others follow railroad methods in the inspection and laying off of locomotives. Bonding and feed-wire erection are improving. Tracks are better lined and graded.

About eight years ago at a meeting of the Coal Mining Institute of America someone said something about transportation problems around the mines and a general laugh greeted the suggestion that the mine had any transportation problems of its own apart from railroad transportation. The leading superintendents of today realize that they have a real railroad system underground, and the very recognition of that fact is a cure for many of the mining evils with which they had formerly contended. One superintendent who realized that the main problem of his mine was transportation was able to convert that operation from a dismal failure to a conspicuous success. There is a distinct value in calling a spade a spade. It sometimes solves your problems for you. In some of our mines with insufficient superintendence to call the mine tracks a "railroad" would in a month or two develop an individual known as the "road superintendent" and in a few months later a road that would make haulage both cheaper and more speedy.

Dunmore Breaker Makes A Specialty of Grate or Broken Coal

By Dever C. Ashmead*
Kingston, Pa.



Pennsylvania Coal Co.'s Fireproof Preparator—Lump and Steamboat, Still Dry, Are Picked on Table by Sixteen Men—Protection of Rock Chutes—Screen Areas Provided—Clay Pipe for Carrying Fine Coal

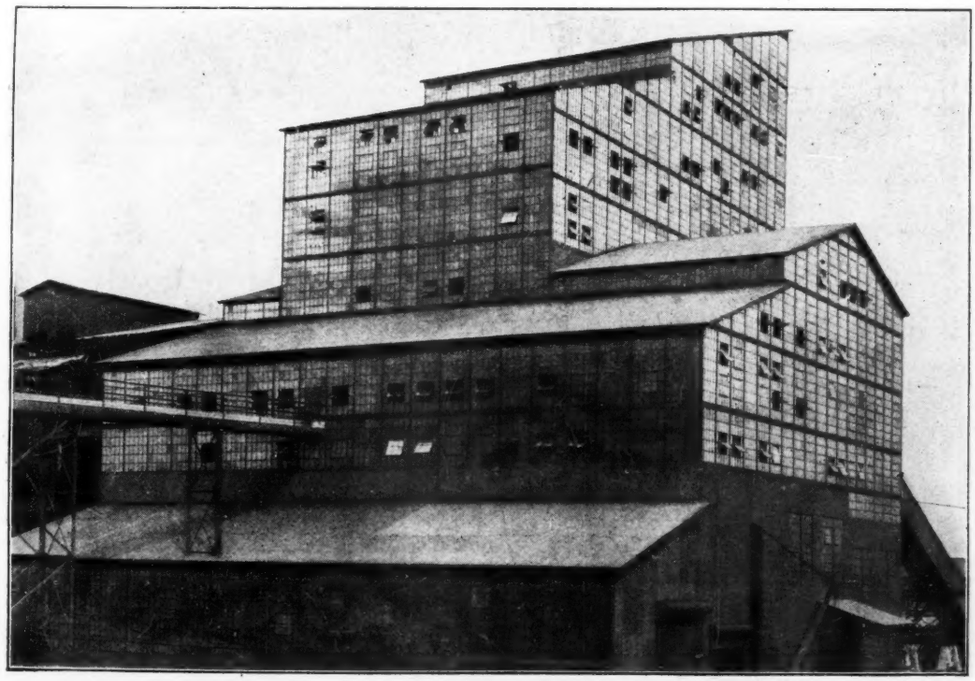
At No. 1 colliery of the Pennsylvania Coal Co., Dunmore, Pa., just outside the City of Scranton, a new breaker has been completed, regarding which a preliminary and incomplete description was given in the paper entitled "Advances in the Preparation of Anthracite," read before the American Institute of Mining and Metallurgical Engineers and appearing in Volume 56 of the *Transactions*.

Since this paper was written the breaker has been finished. It went into operation on Sept. 11, 1922, at the conclusion of the anthracite mine strike. The building is constructed entirely of steel, concrete and glass. Wood was used only for the lining of the loading pockets and the construction of the jigs. The building is as fireproof as it is possible to make a structure of this kind.

*Anthracite Field Editor, *Coal Age*.

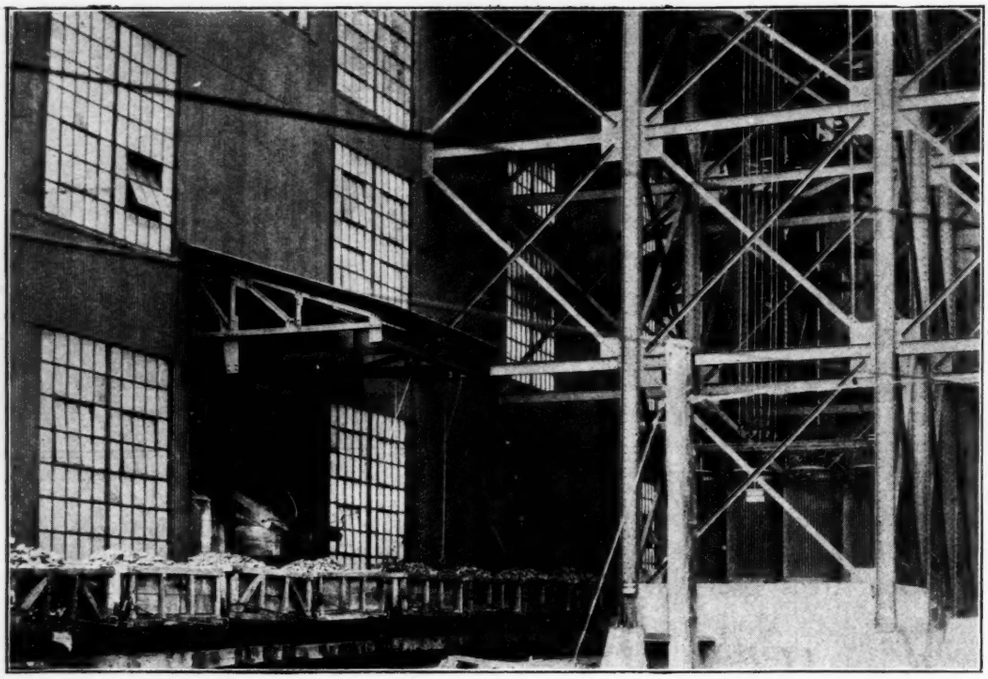
Some features about the building are of considerable interest, differing from those in most of the other breakers in the anthracite field. At this preparator a specialty is made of grate, or broken, coal. The coal is not wetted before it reaches the bull shakers at the top of the breaker but is allowed to pass in a dry condition from the bull shakers to the picking table, where sixteen men carefully remove all loose slate and chip off whatever may be found adhering to the large pieces of coal. Another feature somewhat peculiar to this breaker is that the rock chutes are so designed that only pieces of rock less than 8 in. square can travel down them. The miners are not supposed to put in their cars any slate larger than the size specified.

By thus limiting the size of rock that the chutes will handle these transportation ways are considerably reduced in size and can be made less heavy. Futhermore,



No. 1 Breaker

Structure put in operation for the first time at the conclusion of the recent mine strike. The illustration in the headpiece shows the breaker and the long 385-ft. conveyor line that raises the coal to the top of the building. One of the prominent features of this structure is the excellent lighting provided by the glass sides. The roofs are somewhat more steeply pitched than is customary in the anthracite region. The only parts of wood are the lining of the loading pockets and the jigs.



Terminal Rock Loading Chutes

The rock is all under 6 in. in diameter, as the chutes are not made so that they will accommodate any larger size. Bigger rock is accordingly left in the mines. This provision makes it possible to use rock chutes of lighter weight than is usual. An electric locomotive hauls the rock cars to the rock dump for disposal. Note the transformers on a platform to the right.

small rock can be better inspected than large when it gets to the rock shakers.

The breaker drive is not centered in a single unit but consists of several motors: One of 200 hp. is used to drive the main dragline conveyor and six of 100 hp. actuate the shakers and the jigs. There also are three 25-hp. motors, making a total of 875 hp. installed.

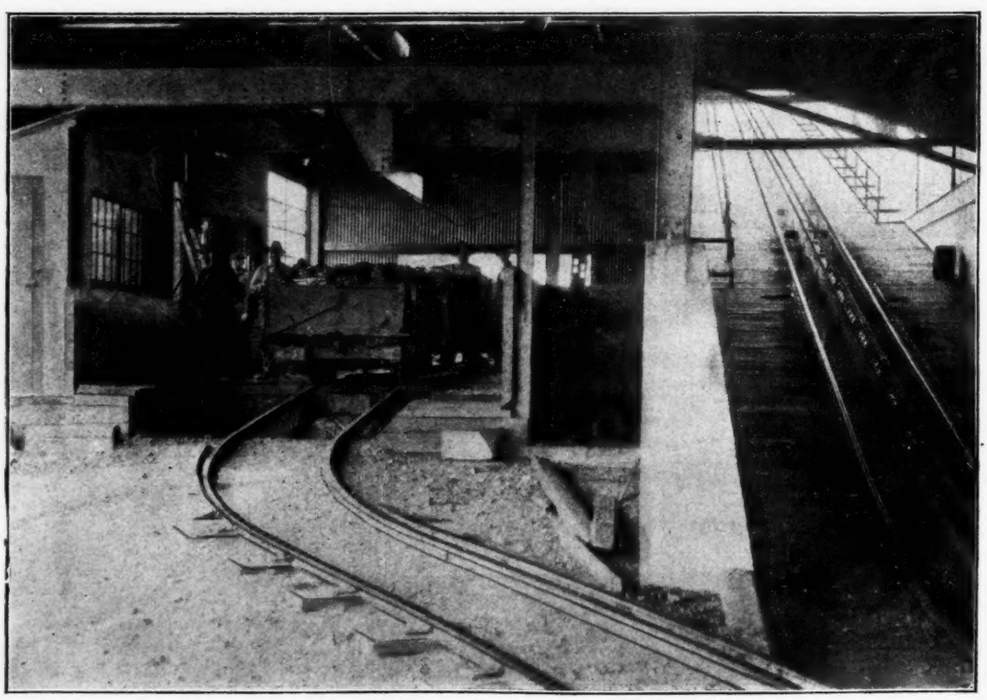
Designed to handle an output of 4,000 tons in eight hours, the breaker has not as yet reached its capacity, but the output during the early part of October ran consistently at about 3,000 tons per day of eight hours. The areas of the shaker screens are as follows: The lump-coal deck has 90 sq. ft. of screening surface; the grate or broken-coal, 225 sq. ft.; the egg-coal, 609 sq. ft.; the stove-coal, 360 sq. ft.; the chestnut-coal, 648 sq. ft.; the pea-coal, 180 sq.ft.; the No. 1 buckwheat-coal, 180 sq. ft.; the rice-coal, 216 sq. ft., and the barley-coal also 216 sq. ft.

In some places in the breaker the chutes are lined with vitrified clay pipe, and this is applied in an unusual way. In the first place a concrete chute was constructed somewhat larger than the half section of the vitrified clay pipe. The pipe was then installed and grouted into place. A distance of from $\frac{1}{4}$ to $\frac{3}{8}$ in. was left between the joints of the pipe lining.

It is doubtful whether this arrangement will prove satisfactory in practice, as the grout is not as hard as the glazed surface of the pipe. In consequence it is likely to be abraded, and then the pipe will be attacked from the edge, and as a result will wear abnormally.

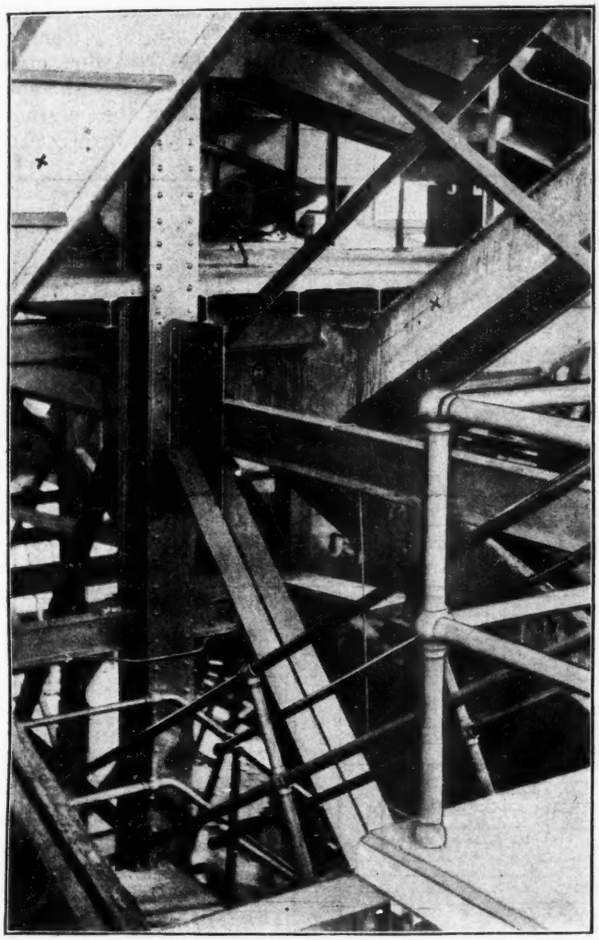
Foot of Conveyor

Here the cars are weighed and dumped, their contents being taken up to the top of the breaker by a conveyor measuring 385 ft. between centers.



It would seem that a longer life would be obtained if the sections of the vitrified clay pipe were laid tight against each other. One of the accompanying illustrations shows this pipe and the construction of the chutes. All the boiler coal is weighed by a fuel meter.

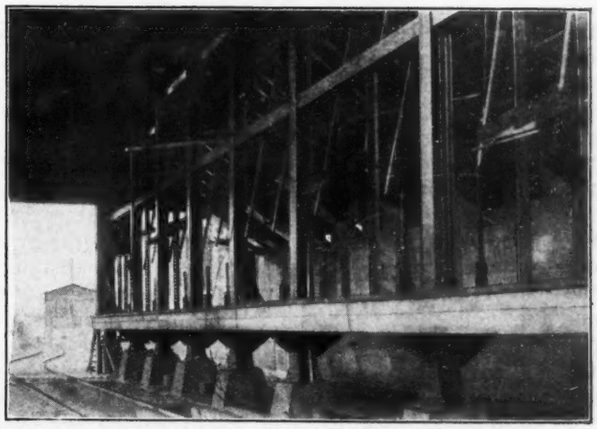
The loss of coal from spillage at the average breaker is considerable. When the railroad cars are loaded some coal will inevitably be spilled either over the top of the car or through leaks in its bottom or sides which have not been properly stopped. This coal usually collects on the ground around the loading pockets until it is finally removed by a man with a hand shovel. Arrangements were made in designing this breaker to avoid this labor. The floors under the loading chutes and the bottom of the breaker have been built of concrete and so arranged that they drain to one point. It is possible, therefore, at this plant to wash all the coal spilled in loading to a tank where the coal settles out of the water and is removed by a dragline conveyor which takes it to the condemned-coal conveyor, whence it is sent through the breaker for re-treatment.



CONCRETE CHUTES WITH VITRIFIED-PIPE LINING

Chutes marked with a cross are of vitrified pipe set in a concrete base. The upper surface of one of these pipe chutes can be seen in the lower left-hand corner. Such chutes are not only fireproof but in some degree serve to stiffen the building in which they are used.

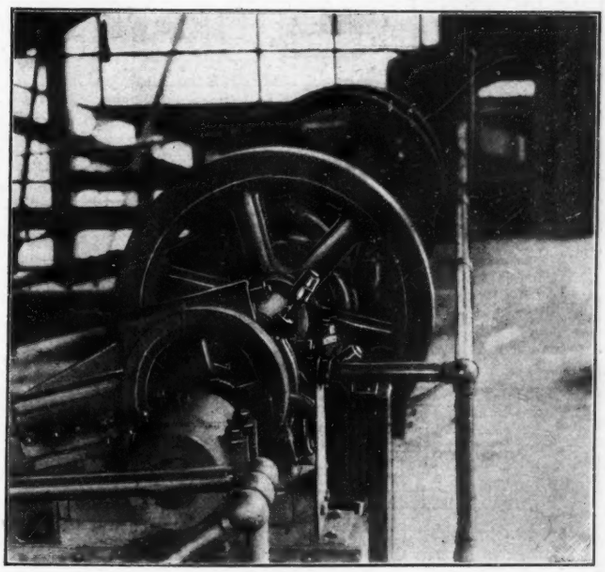
One of the accompanying illustrations shows the flow sheet of the Pennsylvania No. 1 breaker. The figures in the accompanying text refer to those on the illustration. When it comes from the mine the coal goes to the foot of the main conveyor. Here the coal is weighed (1) and the mine cars are dumped by means of a steam dump (2). The coal is then taken to the top of the breaker by means of a Wilmot chain conveyor (3) which measures 385 ft. between centers and has 1¾-in. joint pins. The flights are 5 ft. apart and 4 ft. wide. It has an estimated capacity of 4,000 tons in eight hours.



NO WASTE OF COAL AT THE LOADING POCKETS

The floor of this section of the breaker is of concrete and so arranged that any coal spilt can be washed to a tank below the track and sent back through the breaker for preparation.

When the coal leaves the conveyor it is dumped into a chute leading to the three-deck, main, or bull, shakers (4) in the top of the breaker. The lump coal, which includes the steamboat, passes to a picking chute (5) and is here picked by sixteen men. The coal is kept dry until it is hand picked. Thus the pickers are aided in distinguishing between slate and coal. The broken and egg coal which is taken from the second and third decks of the main shakers (4) pass directly to Elmore jigs (6 and 7). The rock from these jigs is hand picked to remove coal and bone, the latter being sent to the bone rolls (8), from which the crushed material passes to another shaker (9) which makes egg, stove and two sizes of chestnut coal. The coal from the jigs then passes to the picking floor, where the bone left



DRIVING MECHANISM FOR BANK OF SHAKER SCREENS

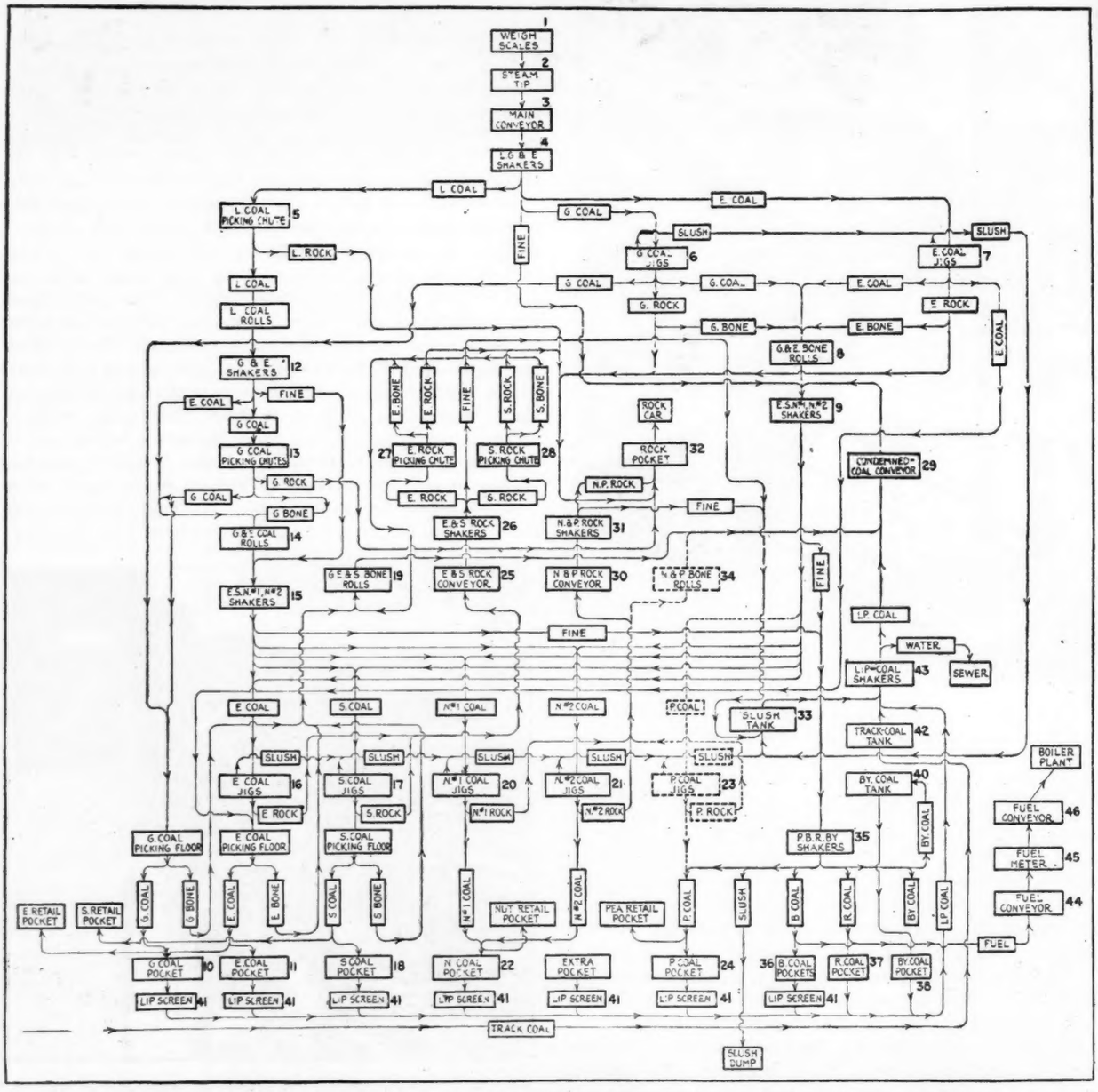
A flywheel is placed on the driving shaft to afford practically uniform rotational speed.

in the coal will be removed. The cleaned product goes directly to the pockets (10 and 11).

Cleaned lump coal from the picking chute (5) goes through the main rolls, and thence to a set of broken, or grate, and egg shakers (12). Grate coal then passes to a picking chute (13) and unites with the egg coal and passes through the rolls (14). Thence it passes to another set of shakers (15) on which egg, stove and two sizes of chestnut are made. The egg, stove and chestnut coal then goes to Wilmot jigs. After cleaning the oal in the jigs, it passes from the egg jigs (16) and the stove jigs (17) and is then hand picked, the cleaned product going to the proper pockets (11 and 18). Bone coal recovered in handpicking the grate, egg and stove coals unites and goes through rolls (19), the crushed product of which will be carried by the condemned-coal conveyor (29) to the shaker (9).

Cleaned coal from jigs (20 and 21) which treat the two sizes of chestnut coal, after uniting, go to the nut pocket (22). Shaker (9) is so arranged that the bottom deck can be changed to produce pea coal; in that case this size passes to the pea jigs (23), the cleaned product of which will go to the pocket (24).

Rock from the egg and stove jigs (16 and 17) unites and is taken by the egg-and-stove rock conveyor (25) to the egg-and-stove rock shakers (26). Here it is separated, after which the bone is hand picked (27 and 28) from the rock and is sent to the grate, egg and stove bone rolls (19), and thence to the condemned-coal conveyor (29). The rock from the chestnut and pea jigs (20, 21 and 23) unites and goes to the chestnut-and-pea rock conveyor (30), thence to a shaker (31), where the fines are removed. The rock then goes to the rock pocket (32) and the fines to the slush tank (33). Instead of sending this rock from the chestnut and pea jigs (20, 21 and 23) to the rock conveyor (30),

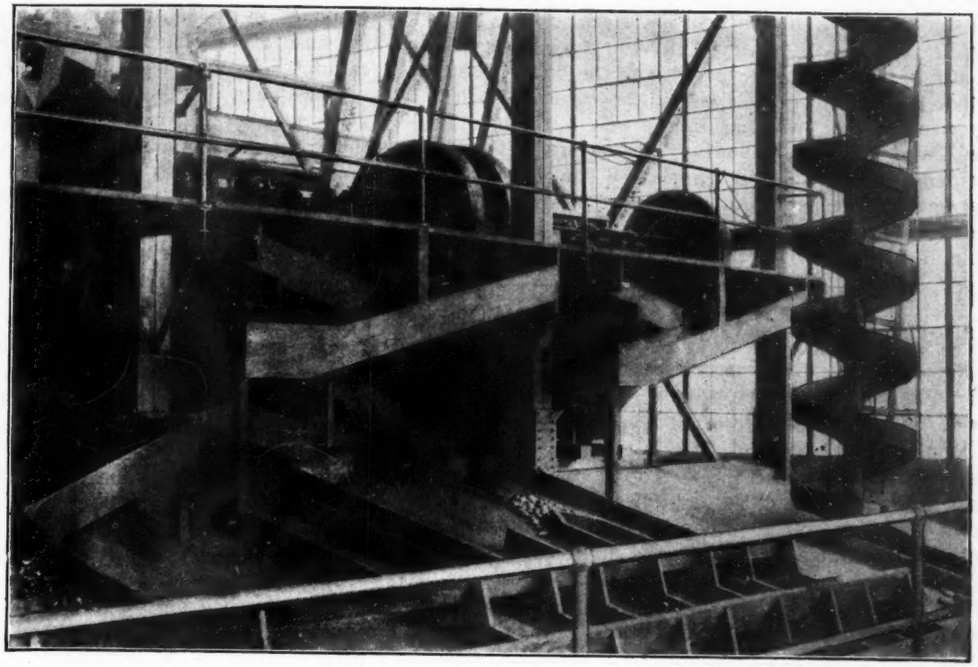


FLOW SHEET OF BREAKER SHOWING WHOLE PREPARATION PROCESS AND LOADING PROVISIONS

In the illustration L = lump; G = grate, or broken; E = egg; S = steamboat; N = nut; P = pea; No. 1 and No. 2 are two sizes of chestnut which are combined after washing and are shipped from a single pocket.

Wilmot Jigs

In this battery of jigs, egg, stove, chestnut and pea coals are cleaned. The spiral chute to the left conveys the broken coal prepared near the top of the breaker to the pocket near the railroad track. It will be of interest to compare the light, uninflammable walls of this breaker with those of the old wooden structures which formerly were all the anthracite region knew. With the old breakers it was difficult to distinguish coal from slate under the unfavorable light conditions obtaining.

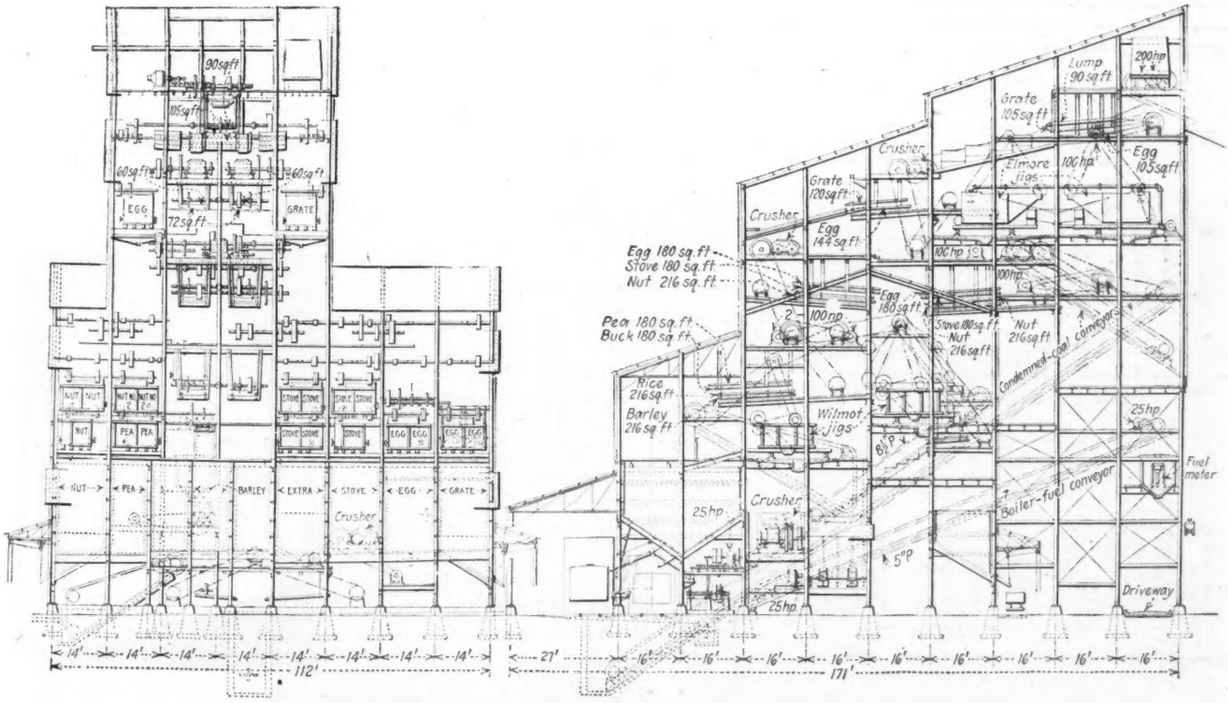


however, it can be sent to the chestnut and pea rolls (34), from which the resulting product is sent to the condemned-coal conveyor (29).

All of the fine coal from shakers (9 and 15) unites and passes to shaker (35), where pea, No. 1 buckwheat, rice, barley and slush are separated. The sized coals without further treatment pass directly to their respective pockets (37 and 38), the slush going to the slush dump (39). The barley coal can be sent from the shaker (35) to the barley tank (40) on its way to the pocket (38). All the slush from the Elmore jigs near the top of the breaker and from the Wilmot jig passes to the slush tank (33).

As already stated, the coal spilled is washed to the track-coal tank (42). All the lip-screen coal (41) is taken to shaker (43) on which it is joined by the track-tank coal. Here the water is separated from it. The coal is then delivered to the condemned-coal conveyor, which takes it back through the breaker for retreatment.

The buckwheat, rice and barley sizes, instead of going to their respective pockets after being screened



LONGITUDINAL AND END CROSS-SECTION OF BREAKER

Lump coal is carefully picked by sixteen men before it is wetted so that dirt can be more readily recognized and eliminated. When the slate is wet the water film, having a black background, has a luster difficult to distinguish from that of coal. The head of the conveyor by which coal is brought to the breaker can be seen on the right.

on shaker (35), can be sent to a fuel conveyor (44) which delivers its material to the fuel meter (45); then it is taken by conveyor (46) to the boiler plant.

The old breaker required approximately 150 men to prepare the coal, whereas in the new building only 66 men are required, including all loaders. These are divided as follows: 7 jig runners, 6 shaker tenders, 16 platemen, 3 sweepers, 1 oiler, 18 slate pickers, 1 breaker foreman, 2 carpenters, 1 machinist and 11 loaders. Thus a large saving in labor is afforded, and this economy in itself will give a considerable return on the cost of construction of the new breaker, which is estimated to have been between $800,000 and $900,000.

Every new breaker shows a large saving over previous breakers. This one is certainly no exception to that rule and the saving in this instance would be more marked were it not for the fact that a special grade of coal is required at this breaker. Except for this it is possible that many of the sixteen platemen now employed might be dispensed with.

Reporting Delays Lowers Production Costs

By George Edwards
Pikeville, Ky.

AN IMPORTANT item of expense in coal-mining operations is delays. It is a common occurrence at the average coal mine for the tipple to be waiting on coal, the main-haulage locomotive standing idle at the main sidetrack, and at other times the gathering locomotives and mules waiting on the main-line locomotive.

The explanation that usually will be given on inquiry is that the delay has lasted only a few minutes. Further questioning brings one no closer to the real trouble, for it is a common failing with most of us to blame delays or other failures on someone else.

Recently at a new and modern mine, where preparations are being made to handle a large tonnage, 12 minutes was lost while a car of slack was being moved and another car was being placed under the chute. The most common delay on main-haulage roads is derailments, inconvenient switching room inside and out, and frequently failure to move the trips owing to the desire to haul longer trips than the locomotive can handle.

A boss newly engaged recently found that the main-line motors had perpetual trouble in moving their trips. He decided on smaller trips and more of them, and his plan resulted in an immediate increase in production.

But the bane of the gathering crews' existence is derailments and lack of space to get around the mine cars and trips easily and speedily, the latter trouble being due to low entries and to roadways narrowed along the clearance side by standing posts and timber sets and by loose material such as ties, rails, posts, slate and coal laid alongside the tracks. This is often the first fault to be rectified.

A good plan when studying delays is to have "delay reports" made out daily by drivers, motormen, tippleman and others for a month or more at a time. In this way the causes of delay of every kind can be placed where they belong. The attached reports, used periodically by the North East Coal Co., in Kentucky, have proven to be most valuable in locating trouble and keeping everybody moving.

REPORT OF TIME LOST ..... 192.....

BY ..... AT .....
(Name of Driver) (Place of Work)

NUMBER OF LOADERS ON YOUR HAUL TODAY .....

Trip No.	Cars Hauled	Waiting on Empties	Waiting on Loads	Waiting for Other Driver	Blocked by Mining Machine	Off Track	Bailing Water	Other Causes	Explain below any lost time shown in column headed 'Other Causes.'

REPORT OF TIME LOST ..... 192.....

BY ..... MOTOR NO. .....
(Motorman.)

HAULING FROM ..... TO .....

Trip No.	Loads Hauled	Empties Hauled	Waiting on Loads	Waiting on Empties	Waiting on Other Motors	Off Track	Motor Breakdown	Other Causes	Motormen gathering from several side tracks should show below at which side track delayed, and point at which held by other motor. Also explain below any lost time entered in column headed "Other Causes."

REPORT OF TIME LOST ..... 192.....

AT NO. ..... TIPPLE .....
(Name of Weighman.)

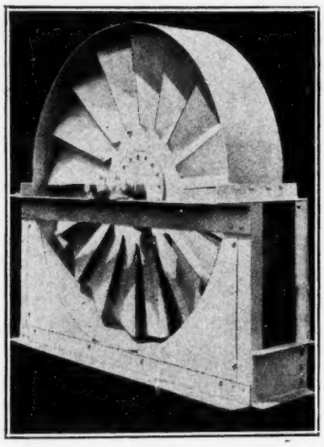
Time of Day	Waiting on Railroad Cars	Changing Railroad Cars	Cleaning Railroad Cars	Switching Railroad Cars	Waiting on Loads	Cars Derailed on Tipple	Tipple Breakdown	Other Causes	Explain below any delays entered in column headed "Other Causes."

DELAY RECORDS FOR WEIGHMAN, MOTORMAN AND DRIVER

What records of accidents have done for safety, records of delay may be expected to do for steadiness of operation. Much has been said of wasted coal in coal mines but the pitifulness and unprofitableness of the waste of time should be just as apparent.

Disk Fan Actually Made from Metal Disks

A DISK fan usually is a machine built up with the aid of rivets. The illustration shows one that actually is made out of two disks by merely cutting the fan radially and pressing into fan blades the sixteen sectors thus formed. The two disks are placed back to back and riveted together, forming a wheel 5 ft. in diameter. The blades overlap one-half their width for their entire length. The bearings are collar oiled and are proof against suction, which sometimes draws out the lubricant. The fan is made by the Pittsburgh Fan & Manufacturing Co., Bessemer Building, Pittsburgh, Pa.



PRESSED-STEEL DISK FAN

This fan is made by merely cutting and pressing two disks (which have been riveted together) so as to form blades.

Temple Coal Co. Supplements Its Breathing Apparatus With Mask That Absorbs All Poisons in Mine Air

In Devitalized Air Oxygen-Breathing Equipment Alone Can Be Used, but in Many Cases Where a Safety Lamp Will Burn, Work Can Be Done Safely in the Right Kind of Mask

BY DEVER C. ASHMEAD*
Kingston, Pa.

IN PRACTICALLY all parts of the anthracite fields one of the great dangers of mining is from the emission of gas. No matter what ventilating precautions are taken, how completely safety lamps, electric and flame, are furnished, how closely the men are inspected to see if they are carrying matches beyond danger points, or how rigorously the working places themselves are inspected, gas explosions will occur as long as man mines coal.

With the danger of these explosions always in mind coal-company officials in the anthracite region have established rescue stations at the various collieries. One of the most modern and well-equipped of these is that of the Temple Coal Co. at its Mount Lookout Colliery, near Pittston, Pa.

This station has six Gibbs oxygen apparatus, Edison electric lamps, Wolf safety lamps, carbon-monoxide detectors, an oxygen pump and cylinders, a mercury manometer for testing apparatus, a resuscitating device and six Burrell all-service gas masks.

After an explosion of methane, afterdamp is formed, which consists of oxygen, nitrogen, methane, carbon dioxide and carbon monoxide. In many cases enough oxygen is present to support life, but, unfortunately, it is not possible for a man to live in an atmosphere that contains much carbon monoxide. In consequence men who have hitherto engaged in rescue work have had to wear a helmet that would provide them with oxygen and would also exclude from the atmosphere they breathed any carbon monoxide.

*Anthracite Field Editor, *Coal Age*.

After a long series of experiments a chemical known as hopcalite has been discovered that will change carbon monoxide into carbon dioxide. It is used in the all-service gas mask. This chemical, together with charcoal and calcium chloride, is placed in a canister which is shown hanging from the necks of the men in one of the illustrations.

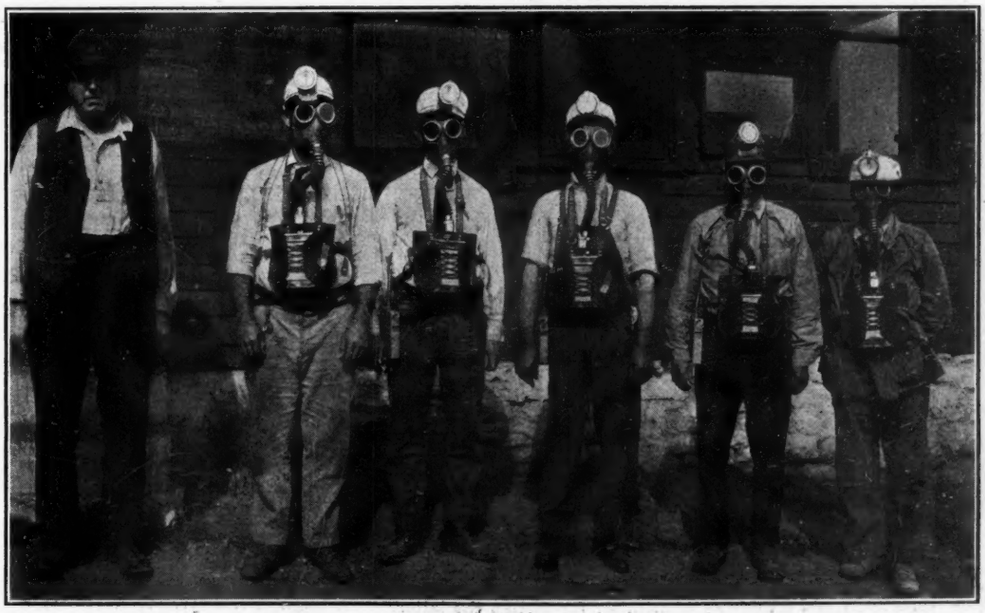
Air is admitted through the bottom of the canister and as it passes through the charcoal it is filtered, the smoke being absorbed with any ammonia gases which it may contain. It then passes through the calcium chloride, which absorbs the moisture, and then through the hopcalite, which changes the carbon monoxide into carbon dioxide. Again the air passes through calcium chloride and then through another layer of charcoal, and then into a timing device. Sufficient hopcalite is provided in the canister to last for two hours.

With each breath the timer is actuated. The breath operates a small valve which revolves an indicator in a clockwise direction around a dial. This action is automatic, the position of the dial indicating the length of time the canister has been used and of course the length of time that canister can be worn before being recharged. Each canister is good for a two-hour period of actual service, whether worn intermittently or continuously.

One important feature is that the air of the mine is dried in the canister and is so deflected that it strikes the lenses of the face mask so that they remain clear under all conditions. This deflecting of the dry air against the lenses removes all moisture that might be

Gas-Mask Crew

These men are fitted with gas masks which can be used for two hours in any afterdamp mixture so long as there are breathable quantities of oxygen present in the air. Thus the mask may be worn wherever a light will burn. The hopcalite used in the mask has the power of rendering a certain quantity of carbon monoxide harmless by oxidizing that gas and forming carbon dioxide.



RESCUE CREW AT MINES OF THE TEMPLE COAL CO. AT MOUNT LOOKOUT COLLIERY, NEAR PITTSTON, PA.

At this colliery six oxygen apparatus, six all-service gas masks, several electric lamps, safety lamps, carbon-monoxide detectors, an oxygen pump and cylinders and a resuscitating device are kept ready in case of accident.

deposited by the exhaled air. The air passes out through the exhalation valve, which opens on exhalation and closes upon inhalation, so that the wearer gets absolutely fresh air at each breath.

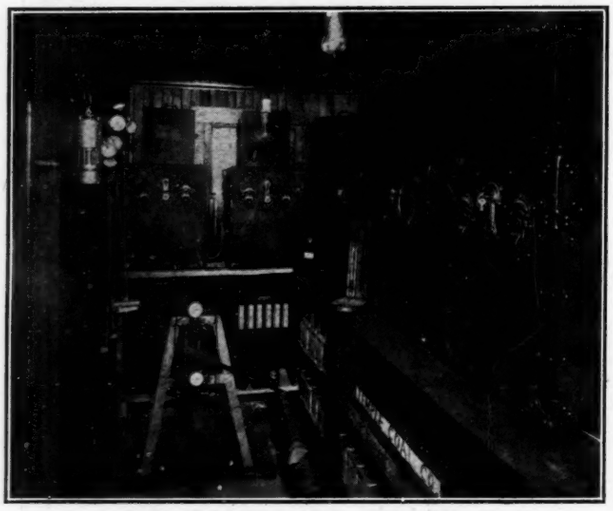
The mask gives all the protection a self-contained oxygen apparatus will give, provided enough oxygen is present in the surrounding atmosphere to support the flame in a flame safety lamp. In other words a flame safety lamp is the guide in knowing how far to travel, for it indicates when a point has been reached at which the oxygen content of the atmosphere is too low to support life under exertion. The safety lamp will be extinguished when the oxygen in the air falls as low as 16 per cent. As a man can live in an atmosphere which contains as little as 12 to 13 per cent of oxygen the indication of the expiring flame of the safety lamp affords a liberal factor of safety. As the hopcalite is not affected by a change in temperature, the mask will furnish protection regardless of the heat or cold to which it is exposed during or before service.

Gas Mask Has Advantage of Lightness in Weight

The Burrell gas mask has another advantage over the oxygen apparatus. It is extremely light, weighing only 5¾ lb. Thus the wearer can do heavy work and not become as fatigued as when wearing the oxygen-breathing apparatus. The gas mask is particularly valuable in re-establishing ventilation and for exploration work, particularly in advance of the working gangs. Members of the rescue crew also can use this type of mask in keeping open communications with the oxygen-apparatus squad and the base of operation at the foot of the shaft.

In making preliminary explorations of mine fires it would be quite helpful, for it would permit the superintendent or mine foreman to make his preliminary explorations of the conflagration without exposing himself, as such men too often do, to the danger of carbon-monoxide poisoning.

A few gas masks of this kind kept in the mine might serve pumpmen, stablemen and others well should a fire break out during an off shift when they alone are on duty. It would practically assure their arriving at the surface in condition to report the occurrence of the fire. Another purpose for which it might be valuable is in protecting shotfirers and firebosses from monoxide poisoning. Misfires often occur which set fire to the working places. A gas mask of the all-service type would permit the shotfirers to make explorations in safety despite the heavy smoke that arises from such fires.



EQUIPMENT ROOM OF RESCUE STATION

In the foreground may be seen the oxygen pump and on the shelves, boxes and trunks containing gas masks and rescue apparatus respectively and a mercury manometer for testing the latter.

Wages Paid and Selling Price of Coal and Coke in West Virginia

(Year Ended June 30, 1921)

County	Pick Miners Paid Per Gross Ton Run-of-Mine: Car	Ton	Selling Price: Coal	Coke
Barbour	$1.27	$0.82	$4.59	$6.75
Boone	.....	.79	4.35	.....
Braxton	.....	.96	4.84	.....
Brooke	1.12	1.12	3.75	.....
Clay	.....	.93	4.10	.....
Fayette	1.11	.92	4.39	10.90
Gilmer	.98	.98	5.84	.....
Grant	1.41	1.06	4.99	.....
Greenbrier	.....	.87	6.99	.....
Harrison	1.09	.92	4.43	9.63
Kanawha	1.37	.93	4.37	.....
Lewis	1.24	1.01	5.38	.....
Lincoln	1.03	.92	4.14	.....
Logan	1.07	.94	4.64	.....
Marion	1.23	.99	4.67	11.62
Marshall	1.24	.96	4.25	.....
Mason	.92	.92	4.10	.....
McDowell	1.16	.94	4.51	10.10
Mercer	1.38	.89	4.51	.....
Mineral	1.40	1.04	5.38	.....
Mingo	1.12	.97	4.07	.....
Monongalia	1.17	.98	4.55	8.84
Nicholas	1.12	.97	4.95	6.75
Ohio	1.32	1.01	3.38	.....
Preston	1.12	.96	4.76	9.93
Putnam	1.02	1.02	3.94	.....
Raleigh	1.09	.87	4.72	.....
Randolph	1.27	.93	4.09	10.00
Summers	.....	.89	.....	.....
Taylor	1.01	.84	4.89	.....
Tucker	1.26	.99	4.26	.....
Upshur	1.18	.94	4.76	11.93
Wayne	.....	.93	5.05	.....
Webster	.....	1.01	7.08	.....
Wyoming	1.02	.94	4.74	.....
Averages	$1.17	.95	$4.65	$9.58

Keeping the Storage Battery Young and Lively

Danger of Manual Adjustment in Charging Lead Battery—Disadvantages of True Constant-Potential Charging—Modified Constant Potential with 2.6 Volts per Cell and Fixed Series Resistor Recommended for Lead Battery

By M. F. Packard*
East Pittsburgh, Pa.

Too much emphasis cannot be placed on careful charging, for the life and performance of the storage battery are so largely dependent on the way in which this work is done. Ignorance of the requirements and carelessness in their fulfillment are responsible for most premature battery failures. For this reason this article will discuss the charging problem, indicating the advantages and disadvantages of various methods, so that the one best adapted for a given condition may be selected. Only the vital phases can be discussed and then only briefly, for the subject is a lengthy one.

In charging a lead battery it is of greatest importance to avoid gassing at high charging rates and to keep the cell temperature below 110 deg. F. Until the prescribed finishing rate is reached these requirements are fulfilled by adjusting the charging rate in amperes to a value at all times less than the ampere hours out of the battery. The locomotive should be equipped with a reliable ampere-hour meter, which will indicate the ampere hours out of the battery and be a guide in determining the discharge limit.

The ampere-hour meter is designed to run slow on charge and when used on a lead battery should be adjusted so that about 15 per cent more ampere hours will be returned than were taken out. The ampere-hour efficiency varies somewhat with the battery construction and charging conditions, so it may be found necessary to depart a little from the figure given. The meter may be readily adjusted, however, and a few trials will determine the best setting. The battery-compartment cover must be left open throughout the charge, so that the highly explosive gases that are given off by the battery during part of the charge can escape freely. No lighted tobacco, matches or other exposed fire or sparks should be allowed in the vicinity of the battery while it is being charged.

In the past the charging current has been adjusted quite extensively by hand, but when the charge was thus regulated the battery frequently was damaged severely in consequence of the ignorance or carelessness of the attendant. It is seldom practicable to hold the ampere input equal to the ampere hours out of the battery, as this involves too constant attention, and there are objections to the size of the equipment needed, as will be shown later in discussing constant-potential charging.

The usual procedure is to start the charge at a fixed rate in amperes—termed "the starting rate"—continue at this rate till the battery begins to gas, and then reduce the current to "the finishing rate," which is held to the end of the charge. All locomotive type batteries have these two rates designated and they can be approximated by occasional adjustment. The danger is that the initial rate may be continued after the battery has begun to gas violently. This dislodges the active material and causes overheating, with the destruction of the separator.

The finishing rate of charging may be continued for a reasonable time after the battery is fully charged without causing injury. The charging current is adjusted either by varying a series resistor or the field of the generator. The latter is most economical, but with series resistance less frequent adjustment is needed, as it acts as a ballast and the current may remain fairly constant if the difference between the line and battery voltages is great enough. The approximate cell voltage during a charge by this method is shown in Fig. 1, curve *A*.

An automatic charging system is greatly to be preferred to one necessitating manual adjustment and, moreover, it is entirely practicable. True constant-potential charging is automatic in so far as regulation of the charging rate is concerned, and with suitable protective apparatus no attention will be needed after the charge is started. The voltage chosen is such that the current will taper with the rising counter electromotive force of the battery and always be approximately equal to the ampere hours out of the battery.

Fig. 2 illustrates what takes place during a charge by this method. This system has several drawbacks which make its use ordinarily impractical. These are: (1) The excessive power that is required in the early stages of charging a completely discharged battery. (This makes both the investment in generating equipment and the demand charges high.) (2) The difficulty in preventing excessive voltage fluctuations and (3) the

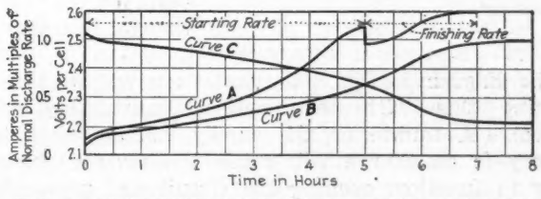


FIG. 1—CHARGING CURVES FOR LEAD BATTERY

These curves are only approximate, for the actual results will vary with the temperature, condition and structure of the cell. Curve *A* shows the volts per cell with the normal two-step charge, curve *B* the volts per cell with a modified constant-potential charge where the battery is being charged with a line pressure of approximately 2.6 volts per cell, curve *C* the current when the cell voltage is that recorded in curve *B*.

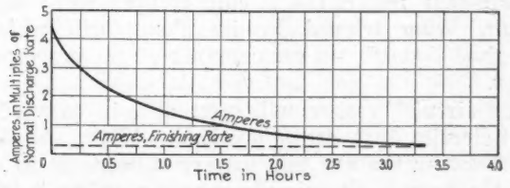


FIG. 2—CURRENT CURVE, CONSTANT VOLTAGE CHARGE

As in Fig. 1 these curves are only approximate, for the actual results will vary with the temperature, condition and structure of the cell. The potential of the constant-voltage charge is 2.3 volts per cell. This also is for the lead battery.

*General engineering superintendent, Westinghouse Electric & Manufacturing Co.

necessity for adjusting bus voltage to meet seasonal temperature changes.

The simplest and safest automatic charging system probably is that called the modified constant-potential method. Best results can be obtained with a fairly uniform voltage, but fluctuations are not harmful provided adjustment is based on maximum potential, their only effect being to prolong the time required for the charge. The most suitable potential is 2.6 volts per cell, and this should be provided. A fixed series resistor also is required.

For higher voltages greater resistance must be used, and the time for a complete charge will be correspondingly lengthened. Lower voltages can be utilized, but the objectionable features of the true constant-potential system begin to arise. Typical voltage and current curves for a charge of this nature with a bus potential of approximately 2.6 volts per cell are given in Fig. 1, curves *B* and *C*. It will be observed that the current tapers as in the case of true constant - potential charging, but at no time does it exceed a permissible value. By this method the initial peak is never excessive and the charge is ended at the finishing rate or less. The charging apparatus for any of the tapering-current systems can be made so as to disconnect the battery upon power failure, to re-establish connections upon the return of power and finally open the circuit when a full charge has been given to the battery or accumulator.

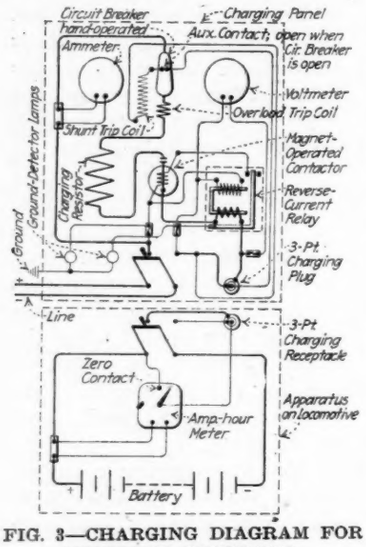


FIG. 3—CHARGING DIAGRAM FOR MODIFIED CONSTANT-POTENTIAL CHARGE

A failure in the voltage supplied while the battery is being charged will cause the revers-current relay on the right to function, opening the circuit and preventing the cells from discharging into the line. When power returns, the magnetic contactor will reconnect the battery.

The diagram in Fig. 3 illustrates one way of accomplishing this with the modified constant-potential system. A failure of the supply voltage when the battery is on charge will cause the reverse current relay to function, opening the circuit and preventing discharge by breaking the closing coil circuit of the magnet contactor. Upon the return of power the magnet contactor will reconnect the battery, its closing coil being energized through the contact of the reverse-current relay, which will be closed by its shunt coil. Upon completion of the charge, as determined by the ampere-hour meter, the circuit breaker will open the circuit, being tripped by its shunt coil, which is energized through the zero contact of the ampere-hour meter.

The circuit breaker will open also in case of any short-circuits that cause overload. When the difference between the line and battery voltages is so great that the time of charging becomes excessive, it is possible to use a two-step resistor and increase the rate during the first part of the charge, automatically reducing it at the correct point by a circuit breaker controlled through an auxiliary contact of the ampere-hour meter.

In cases where a single lead battery is to be charged from a motor-generator set the generator can be designed with a drooping characteristic such that the current will taper essentially as in the modified constant-potential system. Furthermore, the series resistance may be omitted. The disadvantage of this is that it is applicable only to a single battery of fixed capacity and of a given number of cells.

It should be borne in mind that all automatic charging outfits need some adjustment subsequent to installation, as the manufacturer seldom knows the exact voltage conditions or the loss in voltage in the connecting wires. Either resistors are provided with taps to permit slight changes or a certain degree of generator-field adjustment is possible, and a little experimenting will determine what is needed.

What is termed an "equalizing charge" must be given to a lead battery approximately once each week, whatever normal charging method is used. This consists of a prolonged overcharge, disregarding the ampere-hour meter, at a rate preferably about one-half the finishing rate, though if conditions make a reduction impossible, the finishing rate may be used, provided the cell temperature is watched and kept within the permissible limit. The object of this charge is to make up for any deficiency in normal charging caused by inaccuracies in the ampere-hour meter or by peculiarities in the individual cell and to be absolutely certain that all the cells and all the plates in each cell are fully charged.

It is advisable to use one cell of the lead battery as a "pilot cell" as a guide to the condition of the whole. Before discontinuing the equalizing charge all cells of the battery should be gassing freely and evenly and three consecutive half-hour readings should show no increase. Occasionally, at the end of an equalizing charge, a record of the specific gravity of each cell should be taken. A slightly higher final cell voltage is required for equalizing, but usually no special provision need be made, as the load is small and the natural regulation sufficient. When the straight constant-potential system is used, however, it frequently is impracticable to raise the bus voltage as much as is necessary, in which case the battery must be divided into two groups and a series resistor inserted.

It is sometimes necessary that a battery stand idle for a prolonged period. The simplest way to prevent deterioration is to give it an equalizing charge about once a month and, of course, add water occasionally. If this infrequent charging is impossible it usually is best to dismantle the battery, and instructions to suit the conditions should be obtained from the manufacturer.

Charging Requirements of Nickel-Iron Battery

The requirements for charging batteries of the nickel-iron type differ in many respects from those enumerated for the lead battery. On the whole there is much less chance of injuring the battery by improper charging, though the performance and output may be adversely affected if certain precautions are neglected. The charging rate is limited only to that which will not produce a cell temperature in excess of 115 deg. F. or cause frothing at the filler opening. The greater internal loss renders the possibility of overheating much more acute than in the case of the lead battery; therefore the temperature should be carefully watched.

Normal charging for a battery of this type is at constant current, and the value chosen by the manufacturer has been found by experience to give the best results. When that current has been adhered to, practically maximum capacity is obtained and the chance of overheating, with the battery as commonly installed in locomotives, is small. The temperature of a battery will rise during discharge. How much depends on the time of discharge. Consequently it seldom is advisable to start charging just as soon as the locomotive returns to the shed. Before current is fed to it the battery should be permitted to cool.

An ampere-hour meter is about the only convenient guide for determining the state of charge, as readings of the specific gravity of the electrolyte are of no value. The meter should be adjusted to run slow on charge so that about 25 per cent more ampere hours will be returned than were taken out. As in the lead battery, some departure from this value may be advisable.

Should the extent of the previous discharge be unknown the battery may be considered fully charged when the voltage has remained constant for 30 minutes at about 1.9 volts per cell with normal current flowing. The precautions mentioned for the lead battery with respect to ventilation of the compartment and exposed flames should be strictly followed.

The nickel-iron battery will give its best performance if charged at the normal constant-current rate. To obtain a reasonably constant current, without excessive loss, the current flow must be adjusted manually. Practically the only objection to this method, if the precautions mentioned are taken, is the attention required. The danger of overheating is not great, and overcharging is not harmful. The charging rate is satisfactorily adjusted either by varying a series resistor or the field of the charging generator, as in the case of the lead battery. The curve, Fig. 5, shows the variation in terminal voltage for constant-current charging.

Finishing Current Too Weak to Be Effectual

Though strictly constant-potential charging without series resistance does not involve as high an initial peak as in the case of the lead battery the tapering of the current to a small value at the end of charge is objectionable. It has been found that the portion of the charge at less than the normal value of current is not sufficiently effective in performing the necessary electro-chemical action to charge the battery completely. The effects are shown by sluggish action and a gradual reduction in the effective discharge voltage. The battery is in no wise harmed by this treatment and may be restored to a healthy condition by means of overcharging and several cycles of normal charge and discharge. The employment of this method is practically precluded by the inefficiency and poor performance of a battery regularly thus charged.

Automatic charging, of course, is very desirable and it is most commonly obtained by practically the same method as that termed "modified constant-potential" in the case of the lead battery. The scheme of connections shown in Fig. 3 applies equally here. The use of a fixed resistor will result, of course, in a tapering charging current and loss of capacity similar to that experienced when true constant-potential charging is employed, but the effect becomes less as the variation in the current from start to finish decreases.

The charging current should average practically normal and the variation will be less as the series resistance and bus voltage per cell are increased. The energy loss is quite appreciable when the resistor is of a value to give satisfactory results. Experience has shown that a battery can be kept up to essentially full capacity if the charging current is not permitted to fall below approximately 80 per cent of normal at the end of charge. The extremes allowable with this method are therefore from 20 per cent above to 20 per cent below the normal rate. This requirement necessitates a line voltage equivalent to about 2.25 volts per cell. The approximate current and cell voltage curves for charging through series resistance with a line voltage of 2.25 volts per cell are shown in Fig. 4. Increasing the line voltage and series resistance is favorable, of course, to the battery performance, but results in greater losses.

This type of battery can also be successfully charged automatically without series resistance from a generator designed with a drooping characteristic produced by the combination of differential series and shunt-field windings. The variation in the charging current from start to finish may be even less than the maximum recommended in the preceding paragraph. Only a single battery of fixed capacity and number of cells can be charged from such a generator, and this is frequently undesirable from the standpoint of both convenience and cost.

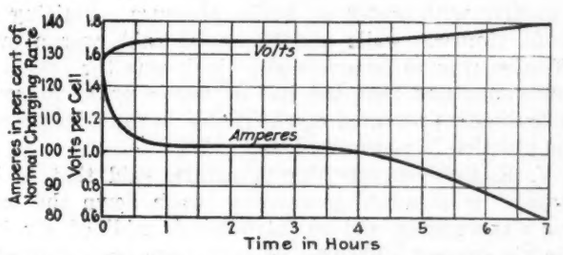


FIG. 4—CHARGING CURVES, NICKEL-IRON BATTERY
Approximate curves with a fixed series resistance and a line potential of 2.25 volts per cell.

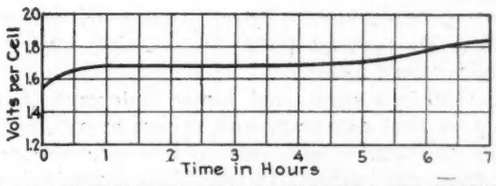


FIG. 5—CHARGING CURVE OF NICKEL-IRON BATTERY
This also is a curve which would be modified with a different condition of battery, another temperature and a changed cell structure.

The nickel-iron battery may be taken out of service and permitted to stand in any state of charge or discharge without any resulting injury. It is necessary to keep the plates covered to the proper height with electrolyte, and therefore distilled water to replace evaporation must be added occasionally. The battery should be stored in a dry place and when put in service again given a long overcharge after careful inspection of the cells.

An equalizing charge such as that necessary for the lead battery, of course, is never given, but an overcharge is often desirable, especially if in normal service the battery is seldom completely discharged. The overcharge should be continued approximately 70 per cent longer than the time required for a complete normal charge and will be most effective for good if the battery is first completely discharged, even to zero voltage.

Stone Dust, Water and Steam as Means of Protection Against Mine Explosions

A DISCUSSION by a representative body of mine inspectors at the annual meeting of the Mine Inspectors' Institute of America this year gave a well-balanced review of the methods to combat the coal-dust hazard now in effect in the United States. There was no consensus of opinion. Most of the men, who spoke from the fullness of their experience with one system or another, agreed that no method was anywhere near 100 per cent perfect, but that as a damper on explosions any and all have a marked effect and each has its place.

Men from both West Virginia and Alabama were strongly in favor of a lavish use of water throughout coal mines from mine opening to face. C. H. Nesbit, of Alabama, past president of the Institute, said that the common method in his state was to wet down mines regularly with water at 80 lb. pressure. Sluicing off roofs, timbers, walls and floors, he said, was a most effective way to remove dust, which was the origin of explosions, and that the use of water under pressure undoubtedly prevented much trouble in the mines where the practice is maintained.

V. E. Sullivan, of West Virginia, said that in his state it is standard practice to wash down the main ways thoroughly and to introduce humidified air into the air courses. Results, he said, have been uniformly good. J. H. Haskins, of Illinois, remarked that if any such volume of water were to be turned loose in the mines in the No. 6 seam in Illinois those mines simply would not be workable. There is too much water there already. He contended that the wetting down plan is not everywhere feasible.

Colorado is a state, said James Dalrymple, chief inspector of that commonwealth, where every imaginable mining problem is encountered and where conditions vary from one extreme to the other, sometimes within a small district. He said the hope is not so much to prevent explosions as it is to prevent coal dust from taking part in them. Naturally complete prevention would be ideal, but as nobody knows how to achieve that Utopian goal, the next best thing is to render dust as nearly innocuous as possible and then strive to reduce the hazards of the face—the spot which Mr. Dalrymple believes the source of most "blows."

Moist Mine, Not Merely Moist Air, Is Wanted

In his state water is used plentifully in certain mines and an effort is made in most of them to humidify the air to a point somewhere above 90 per cent by introducing exhaust steam. But even this is not a reliable protection, he said. A 100-per cent humidification by steam wouldn't prevent a blast. Hence water is used where practicable. Water conditions are so variable, he said, that he knows of regions where a mine that must pump for dear life to keep its workings dry enough to operate is within 15 miles of a mine so dry that wells driven 2,200 ft. get not a drop, and water must be hauled in in tank cars at great expense.

It is well known that steam, as a humidifier, is damaging to mine timbers, causing much trouble in certain operations. Mr. Dalrymple said that he has observed that the damage is much less where humidification goes on 24 hours a day than where it is spasmodic. The continual change from wet to dry is far more damaging than constant moisture.

Humidification has no effect whatever as a deterrent after an explosion once has started, according to J. W. Paul, mining engineer at the Bureau of Mines experiment station in Pittsburgh, Pa. He said experiments have clearly proved that 100 per cent humidification is no better in the face of a blast than 65 per cent. Humidification is of real value, however, in a mine, he said, because it offsets evaporation and so keeps the coal dust wet.

Mr. Paul strongly advocated the use of rock dust to stop the force and spread of explosions. He said that from 5 to 8 lb. of pulverized rock is enough to neutralize all the coal dust produced at a working face in each shift and suggested that it would be a good plan to supply each miner with a bag each day containing that quantity. It would take him just about half a minute to toss the rock dust around and coat the ribs and roof with it. By this means not only would safety be increased but a "concreting" effect would be produced, thus greatly improving the illumination of the working place.

"But," added Mr. Paul, "I don't know whether the men would be willing to spend half a minute doing it."

"I know exactly what they'd say in Illinois," contributed Thomas Back, of Peoria, Ill. "They'd say 'Who's gonna pay us for all this extra work?' "

Others surmised that the miners would use the rock dust to tamp shots. If they did, somebody suggested, why wouldn't that produce the same results? The dust would be thoroughly distributed by the shots, thus producing the desired effect. The answer was that if the shot was good, distribution would be poor.

Salt as a Medium for Gathering Moisture

From that point the discussion shifted to the use of salt as a humidifier when used as stemming by shotfirers. James Sherwood, of Kansas, said that at one time he had encouraged the use of it in his region, for he found that great waste piles at salt mines could be obtained at $1 a ton. Unfortunately as soon as the demand for it was noticed by the salt plants the price went out of sight, and it became too expensive for coal mining.

An expert opinion on the use of salt was asked of S. P. Howell, explosives engineer at the Bureau of Mines experiment station in Pittsburgh. Mr. Howell said the salt would stay in the borehole providing the shot performed as it should, thus rendering the salt worthless for the purpose intended. Only windy shots would distribute it around the room. He said, further, that if the salt were tamped in too close to the explosive it would become, at the moment of firing, an ingredient, thus modifying the strength and character of the explosive to such an extent that the miner would never be able to tell how large a charge of explosive he ought to use to bring down the coal.

The success of the Old Ben Coal Corporation in the use of shale dust as a check against explosions was mentioned by W. L. Morgan, who explained how the dust is suspended along roofs of entries in delicately balanced troughs. The air blast traveling ahead of an explosion dumps the dust into the atmosphere, damping out the force and flame of the "blow" with remarkable results. Experience has shown the safety engineer of the Old Ben company that a mine cleaned and watered by the best-known methods is little, if any, safer than one knee-deep in coal dust. Therefore a tremendous effort has been made for years to find ways of checking explosions after they start. The shale dust is the most effective means thus far developed.

Washing Coal in Large Pipe by an Upward Current of Water

SPEED in washing, the use of the pressure of the water delivered to the washer to accomplish the desired results, the expenditure of a minimum of power and a saving in space are all advantages that can be claimed for the Draper coal washer, manufactured by the Rhondda Engineering & Mining Co., Ltd., of Bridgend, Glamorganshire, South Wales.

The illustration, Fig. 1, shows a washer capable of cleaning 10 tons of coal per hour. It occupies a floor space of only 5 ft. 3 in. x 2 ft., the height being 8 ft. 9 in. If a machine of this kind will do the work claimed for it, it will be unnecessary to build the big structures that have been erected in the past for the washing of coal. A washery then will be a far less conspicuous building.

The unwashed coal is delivered, as shown in Fig. 2, into a small hopper at the top of the washer unit. It falls into another hopper and is met by a current of water striving to escape. This water has entered by a water inlet below the second hopper. The coal is not heavy enough to resist the current, and it is swept into a chute with and by the escaping water. The sulphur and slate, however, can make their way despite the outrush of water and they fall into an 11-in. cast-iron pipe below the real washing section. It drops onto a valve which is built like one of the revolving doors which are installed at large buildings to keep out the cold air and yet admit visitors. This four-winged butterfly valve slowly revolves and removes all the refuse, with only a minimum of water, dropping it into a refuse drum.

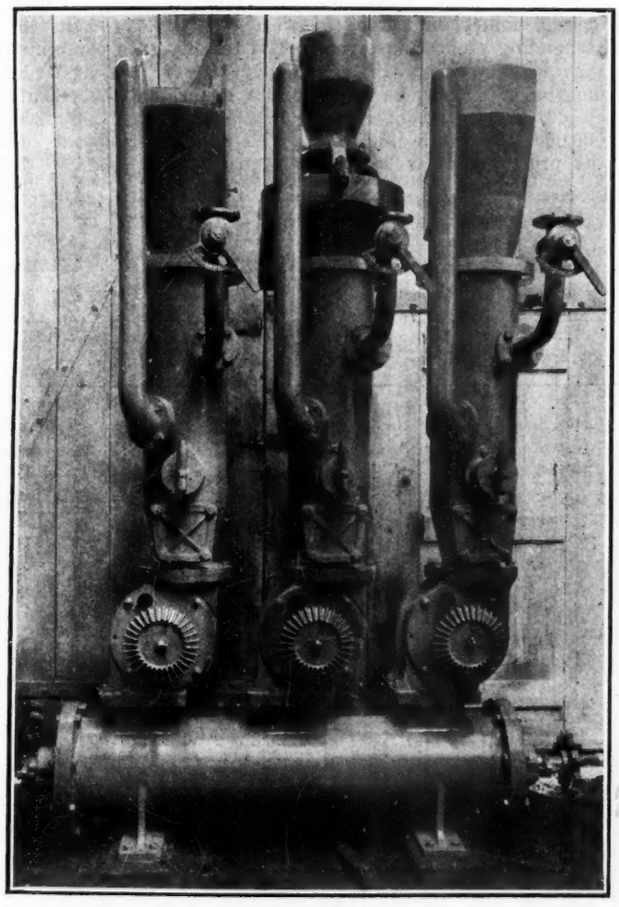


FIG. 1—EXTERIOR VIEW OF THE DRAPER WASHER

Water comes in by the index valves on the small pipes to the right of the larger ones. The coal enters at the top of the large pipes. The coal is held up by the upflowing water and escapes with it by a chute in the rear. Valves turned by the bevel gears just above the drum progressively empty out the waste material as fast as it collects.

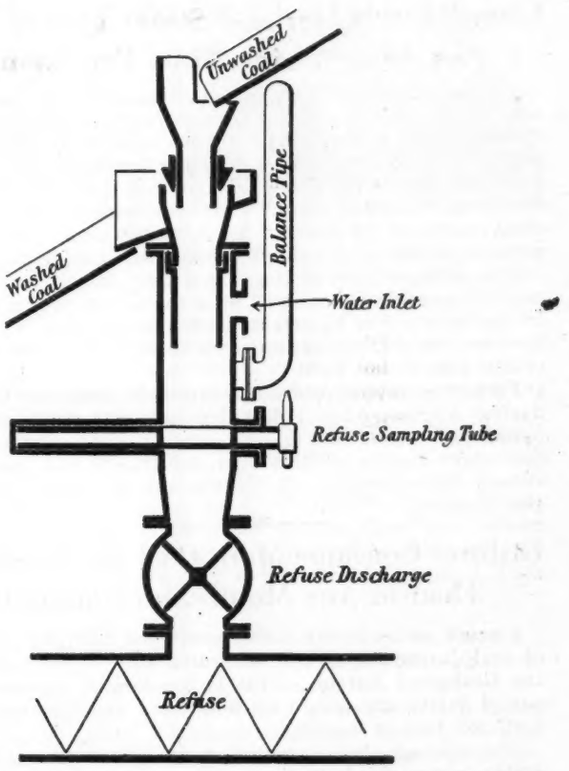


FIG. 2—WASHER ON THE PRINCIPLE OF THE RIFFLE

The riffle washer operates essentially on the principle that water on a grade on meeting a riffle is lifted up by it and that if light and heavy material are being carried along with the water the light will be carried with it and the heavy will stay behind. The trouble is that the riffles soon fill up, and so several are used to give capacity. Here the equivalent to the riffle is deep and also self-cleaning, so the one "riffle" will do the work.

In order to sample the refuse a hole has been provided through the walls of the 11-in. tube previously referred to. In this a sampling tube is placed, held in position by a short boxing on one end and a longer one on the other. The sampling tube is so made as to carry a box which normally is kept with its opening downward. When, however, a sample of the refuse is desired, the tube is revolved and the receptacle filled with the reject. The turning of the sampling tube unlocks it, and it can then be drawn out and the sample dumped into a tray for investigation.

Washer Will Not Break or Abrade Coal

It is claimed that the Draper washer will separate effectively shale from coal of all sizes from the finest dust up to 4-in. cubes. The washer is controlled by the index handle on the water inlet, which regulates the volume of the washing water and hence its velocity. The action of the washer is quite easy and consequently the coal is not broken or abraded by the treatment as it is apt to be in jig washing.

It is said that the water and power used is halved by this method of washing. Several of these washers are at work not only in Great Britain but in Spain, China and France, cleaning not only raw coal but ashes from boiler plants, coke, slack and the reject from other washeries.

Class 1 Roads Used 7,256,000 Tons of Coal In August; Cost, $4.87 Per Ton

During August, 1922, Class 1 railroads consumed 7,256,000 net tons of coal, as charged to account 394, compared with 6,586,000 tons in July and 7,270,000 tons in August, 1921, according to figures published by the Bureau of Statistics, Interstate Commerce Commission, covering 165 reports representing 179 steam roads. Coal consumption for the first eight months of the year totaled 58,925,000 tons as compared with 59,786,000 tons during the same period of 1921.

The delivered cost of the coal during August was $4.87 per ton, as compared with $3.86 in the corresponding month of last year. For the eight months ended Aug. 31, 1922, however, the cost per ton was only $3.82; in the same period of last year it was $4.31.

Fuel-oil consumption by the railroads continued to gain during August, when 126,957,000 gal. was used, as compared with 114,820,000 gal. in August, 1921. During the first eight months of this year 958,879,000 gal. was consumed, approximately 32,000,000 gal. in excess of last year's figure.

Utilities Consume More Coal in September Than in Any Month Since January

Electric public-utility plants consumed 2,907,672 net tons of coal during September, according to a recent report of the Geological Survey. This is the largest tonnage consumed during any month since January and compares with 2,815,685 tons in August.

The average daily production of electricity by public-utility power plants in September again broke all records, this being the third time in four months that records of output have been surpassed. The daily production of electricity in September was 135,200,000 kw.-hr., 3 per cent greater than the August record and nearly 6 per cent greater than the June record.

The daily consumption of both oil and gas in the production of electric power also broke all records in August and September, the consumption of these two fuels in September being especially large in comparison with previous months of this year and of the other years of record, indicating an abnormal use of these fuels which has probably been brought about by the difficulty in obtaining coal.

More Mine Fatalities in September but Fewer In Ratio to Output Than in August

Accidents at coal mines in September resulted in the death of 153 men, according to reports from state mine inspectors to the United States Bureau of Mines. Nineteen employees were killed at anthracite mines in Pennsylvania and 134 were killed at bituminous coal mines throughout the country. In September last year 167 men were killed, of whom 45 were killed at anthracite mines and 122 at bituminous mines. The production of coal was 46,196,000 tons in September, 1922, and 43,329,000 in the corresponding month last year; hence, for each million tons of coal mined the fatality rate for September, 1922, is 3.31 as compared with 3.85 a year ago. During August, last, there were 98 fatalities, or 3.80 per million tons of production.

The average fatality rate for September during the nine-year period 1913-1921 is 3.65 per million tons and the average number of fatalities is 186. Thus the record for September, 1922, shows a reduction both in the actual number of lives lost and the fatality rate per million tons, when compared with September's record a year ago and the general average for the same month since 1913.

On Sept. 23 five men, shaft sinkers, were killed by a falling cage while cleaning out a sump at Raleigh-Wyoming mine No. 2, at Glen Rogers, W. Va.

During the nine-month period January to September of the current year, 1,186 men have been killed by accidents at coal mines, as compared with 1,485 killed in the corresponding months last year. The fatality rate per million tons is 3.98 this year as against 4.07 for the first nine months of 1921. Because of the general strike recently closed, the output of coal in 1922 has reached only 298,000,000 tons, while during the nine-month period last year the production was 365,000,000 tons.

COAL-MINE FATALITIES DURING SEPTEMBER 1922, BY CAUSES AND STATES

(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground												Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total	1922	1921
Alabama	4							1					5													5	5
Alaska																										0	0
Arkansas																										0	2
Colorado	3	1						1					5											1	1	6	3
Illinois	6		3					2					11	2				2								13	14
Indiana												1	1											1	1	2	4
Iowa	2												2													2	3
Kansas		1											1													1	4
Kentucky	1		3										4													4	9
Maryland						1							1													1	1
Michigan																										0	0
Missouri																										0	4
Montana	1						1						2													2	0
New Mexico																										0	0
North Dakota			1										1								1					2	0
Ohio	3		1										4											1	1	5	6
Oklahoma	1												1													1	1
Pennsylvania (bituminous)	14	5	8			1		1		1		1	31										1	2	3	34	35
South Dakota																										0	0
Tennessee	2											1	3								1				1	4	1
Texas																										0	0
Utah																										0	0
Virginia	1												1													1	1
Washington								2					2													2	0
West Virginia	14		5	1		6		4	1				31			5		5	3	1				1	5	41	26
Wyoming	5							3					8													8	3
Total (bituminous)	57	7	21	1		8	1	14	1	1		3	114	2		5		7	3	1	2		1	6	13	134	122
Pennsylvania (anthracite)	4	1	7			1							13			1		1	1	1	1		1	1	5	19	45
Total, September, 1922	61	8	28	1		9	1	14	1	1		3	127	2		6		8	4	2	3		2	7	18	153	
Total, September, 1921	79	11	24	8		16		5		1		10	154	2				2	1	1	3		4	2	11		167

Problems of Operating Men

Edited by James T. Beard

Conferences on Mine Safety Problems

Bureau of Mines Recommends the Certification of All Mine Officials Having Responsible Charge of Mining Operations—Experience Generally Gained Through Some One's Carelessness or Ignorance

AFTER reading a recent circular letter, issued by the Colorado Fuel and Iron Co. and posted on their bulletin boards, I am deeply impressed with the recommendations, which appear to come from the Bureau of Mines.

The bureau is composed of expert mining men and their recommendations should be given careful consideration by every man engaged in the work of mining coal.

The circular bears the caption:

"From U. S. Bureau of Mines,
Conference on Mine-Safety
Problems"

It draws attention forcibly to many of the points that have been widely discussed by readers of *Coal Age*. It is a satisfaction to know that these receive the endorsement of the Bureau of Mines. The safety of life and property, in the mining of coal, cannot be assured, unless the men in charge are thoroughly familiar with the dangers that surround the undertaking and adopt means of preventing accidents.

Certification of Mine Officials Recommended

Chief among the recommendations presented in the letter is the following: "All persons in responsible charge of the direct operation of coal mines, including superintendents, foremen, firebosses, and shotfirers, should be required to have certificates of competency, issued by the state and showing that the applicant has passed an examination clearly establishing his knowledge of what constitutes up-to-date safe practices in the branch or branches of mine operations under his jurisdiction.

"All such certificates should be revocable by the state, for cause, and should expire after five years and be renewed only on taking another examination. The latter requirement would compel all operating mining men to keep conversant with progressive safety practices."

In making this recommendation, the conferees have advanced one step in the certification of mine officials. I note that they recommend that mine superintendents be required to pass an examination before a state board of examiners and hold a certificate of competency issued by the board.

In discussing this question, I have heretofore contended that it was not necessary for a superintendent to be certified, provided the mine foreman holds a certificate. However, the Bureau of Mines engineers are in a position to know whereof they speak, and, as I have said before, if the certifying of superintendents will make our mines safer I am for it heart and soul.

Perhaps I have not given the outside operations sufficient thought. Undoubtedly, there is danger on the surface, as well as underground; and, viewing the situation from a broad angle, I frankly confess that the certification of mine superintendents would not be amiss.

Letter Recommends Limiting the Life of Certificates

Again, this circular letter recommends limiting the life of certificates to five years, after which they must be renewed through the taking of another examination. This suggestion has my heartiest approval. Few will deny that a large number of our certified men neglect to keep posted in regard to the requirements of the mining laws of their states; and technical questions, relating to the various branches of mining, receive little attention after a man has once been granted his papers and has started performing his regular duties.

If I am not mistaken, the purpose of these recommendations is to keep all mining officials, who are responsible for the safe operation of mines, thoroughly familiar with everything that pertains to safe up-to-date practices, regarding the ventilation of mines, danger of dust and explosives, and the use of electricity as employed in the various operations in and about mines.

Miners Should Read Mine Laws

Not long ago, I had the pleasure of listening to a paper on mine accidents. When suggestions were asked regarding their prevention, someone stated that every mine worker should be required to secure a copy of the state mining laws and read them. A few days later, one of the men said to me, "Why did Mr. —— suggest the reading of the mining laws by all mine workers?"

What prompted the question was probably the fact that the Colorado mining laws place the responsibility for the safe operation of mines directly on the shoulders of the mine owners, board of examiners, state and deputy inspectors, mine foremen and assistant foremen, firebosses and shotfirers. Of the 178 sections of our law, I believe only three relate to the responsibility of the worker.

The letter further recommends that every mine should be made the subject of special study, regarding its gas and dust condition. I believe this is already being done by our state and district inspectors. If the suggestion has reference, however, to the Bureau of Mines making such a special study of individual mines, there is little doubt but that they would always be welcomed and every assistance accorded them, in the mines of Colorado.

It was only a few days ago that I overheard a remark made by a mine official who, speaking of a recent mine disaster, said, "we always lock the stable door after the horse is stolen." It would seem true that our richest experience is only gained through disasters caused by the carelessness or ignorance of others. Let us, as mine officials, take to heart the lessons taught by these experiences and profit by them.

Robert A. Marshall.
Walsenburg, Colo.

Locating the Coal Beyond a Fault

Indications left along the line of fault showing upthrow or downthrow—Observations appear to upset generally accepted theory—Discussion asked.

WHILE making an inspection of a coal mine, a short time ago, I picked up an old file of *Coal Age*, in the superintendent's office. It was not long before my eyes rested on an article that interested me. It treated on the method of determining whether a fault of displacement, when found in a mine, was an upthrow or a downthrow.

The fact has long been generally accepted that Nature, in all her constructive phases, has left more-or-less-distinct evidences that enable or, at least, invite a close study for the purpose of determining the conditions under which certain observed geological changes have taken place.

Faults of Displacement Show the Direction of Movement

In respect to a fault of displacement, the belief is well grounded that she has left indications that point to the direction in which the movement or displacement of the strata took place. As the name signifies, a "fault of displacement"

or "dislocation," in a coal seam or other stratum, presents the appearance of the seam having been disrupted along a distinct line that makes a considerable angle with the plane of stratification.

It is plainly evident that the disruptive force has operated across the strata, causing them to break and slide up or down along the line of fracture. For the purpose in hand, we are not interested in the origin or nature of this force, but are concerned only in ascertaining the direction in which the slip of the strata took place.

Problem Presented on Meeting a Fault of Dislocation

The question for the engineer to determine, on meeting such a fault in the coal seam, is: Will the continuation of the seam be found above or below the seam being worked? In order to answer this question, he examines closely the indications that are to be found in the seam and the adjoining strata, hoping that these will point the way.

Referring to Fig. 1, I have illustrated a fault of displacement. Assuming

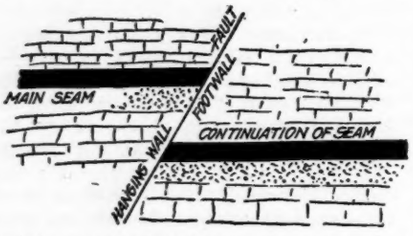


FIG. 1—SHOWING MANNER IN WHICH FAULTING TAKES PLACE

that the portion of the seam shown as lying on the left of the line of fault, marked "main seam," is the one that is being worked, this fault is evidently a downthrow, since the continuation of the seam, shown on the right of the fault line, lies below the portion that is working.

Generally Assumed Condition Not Found in Observed Faults

In Fig. 2 is shown the condition that is generally assumed to result from the slip of the strata on each other when the fault occurred. As indicated in the figure, where the condition is purposely exaggerated, the ends of the strata forming the seam are bent downward and upward, respectively, as they were torn apart when the strata slipped.

In other words, the deflection of the cleavage planes are in the opposite direction from that in which the disruptive force acted on the two respective portions of the seam, throwing the one downward and the other upward, relatively. Thus, the deflection of the cleavages, in either portion of the seam, has been generally assumed to point in the direction in which the remaining portion may be found.

Having had occasion, as a coal miner, to cut a number of faults of displacement at different times, I have always made it a rule to closely observe the conditions existing on both sides of the fault line. In every instance, strange as it may seem, I have found the deflection of the cleavages, in the seam, close to the fault, pointing upward when the displacement was downward, and pointing downward when the displacement was upward.

Proposed Theory to Explain This Seeming Misconception

In my feeble attempt to explain this seeming contradiction of the generally accepted theory regarding faults of

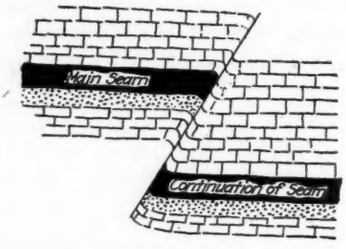


FIG. 2—SHOWING BENDING OF STRATA AS GENERALLY ASSUMED

displacement, I have assumed that, following the action of a disruptive force producing displacement in the strata, there is a tendency, on the part of the disrupted portions, to react or return to their former positions.

This is only a theory of mine that, if correct, would explain my finding of the cleavages, along the line of fault, deflected in the opposite direction from that in which the displacement has taken place. Allow me to present this theory of the action of faults of displacement to the readers of *Coal Age*, with the request that, before pronouncing it as "visionary," they will carefully inspect faults of dislocation that are available to them and give us the benefit of their observations.

Washington, D.C. I. C. PARFITT.

Economy in Use of Mine Timber

Much timber wasted in drawing pillars —Purpose of setting post timber— Conditions affecting the life and use of timber in mines—Greater economy required in its use.

LEADING the excellent article of William Allan, entitled "Where Coal-Mining Practice Could Be Materially Improved," *Coal Age*, Oct. 26, p. 675, one is not a little surprised to observe that he fails to mention the need of more economy in the use of mine timber.

Experience has taught me that there is a greater waste of timber, in the work of drawing back pillars than there is in the mining of solid coal. I have observed that, in nine cases out of ten, the miner is largely to blame for this waste. The average miner either gives little thought to the matter, or is guilty of lack of judgment in setting his posts, in robbing pillars.

Frankly, it is only right that miners should be provided with an ample supply of timber to make themselves safe. At the same time, it is imperative that he should use judgment in standing his posts. This is particularly true in the work of drawing back pillars, when no standard rule can be given regulating the setting of posts.

The practical miner realizes, of course, that posts are never set to support the weight of cover above them, but to safeguard the miner by warning him of an approaching squeeze. This is not saying that squeezes are not continually taking place where pillars are being drawn; but that is no sign of immediate danger. The observed condition of the posts set, however, is an index of the amount of pressure on the timber and the rate at which it is increasing, which is what the miner must know if he is to avoid danger.

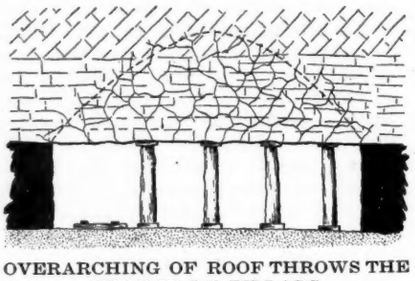
Economy of Timber Requires Close Study of Conditions

Many conditions in the mine affect the life of timbers set for the support of the roof. A study of these conditions, in their relation to timbering, is of the utmost importance in determining the proper use of mine timber.

When mining under a strong roof that is hard to break little timber is required in the first working. Under these conditions, the quality of the timber employed is not of the same importance as where the roof is more treacherous. It don't matter whether the timber is hard, soft, good or bad, when such a roof does begin to break all timbers are alike ineffective to resist the action.

Working Under Bad Roof Demands Strong Timbers

On the other hand, where the roof is bad and breaks readily the chances are that the chambers will have to be propped or retimbered, before the pillars can be taken out with safety. Under these conditions, the quality of the timber employed is of the greatest im-



OVERARCHING OF ROOF THROWS THE WEIGHT ON PILLARS

portance. The posts set must be strong enough to carry the loose material above the opening, while the weight of the overburden arches and rests on the pillars.

Statistics show that more accidents occur where the roof in a mine is good. This is probably owing to the fact that miners fail to keep as close a watch, or take the same precautions that they would when working under a roof known to be bad. The fact goes to show the need of taking every precaution, under all conditions.

Much of the timber used in our mines, today, could be saved if the coal was to

be worked out on the retreating system of mining. This system is too well known to need further explanation than to say that, in the work of development, the headings or entries are driven in solid coal and require far less timber to maintain them than when mining on the advancing plan.

Again, when retreating less timber is required in the chambers, under like conditions of roof and floor. The first chambers are opened at the inby end of the heading, or at the boundary of the property. As soon as these chambers reach the limit the pillars between them are drawn back.

Effect of Change of Seasons on Life of Timber

The life of mine timber is an important factor in economy. In this respect, much depends on atmospheric conditions and the physical surroundings in the strata. At one time, I worked in a mine where the ventilation was subject to change with the changes in the seasons. The intake airway in the winter became the return airway in summer.

In this mine, also, such were the roof conditions that the roadways required to be timbered so closely that one set of timbers could not be put in place, until the old set had been taken out to make room for the new timbers. Owing chiefly to changes in atmospheric conditions, however, the timbers on the main roads, in this mine, had to be replaced more frequently than on any other passageway.

Notwithstanding the increasing use of I-beams in place of timber in mines, it is very essential that more attention should be given to the need of economy in the use of mine timber. Each year, the supply of a good quality of timber for mining, grows less and less.

Cutting Timber to Required Length

Not long ago, a number of writers drew attention, in *Coal Age*, to the need of cutting timbers to the desired length, on the surface, before they are sent into the mine and delivered at the working faces. To my mind, this is an important suggestion and one that is worthy of careful consideration by all mine operators.

Miners have come to me asking for props, but were unable to tell what length they required. Frequently, they would specify a length that was a foot or two too long. In such cases, what they did not use for cap-pieces would be thrown into the gob and lost. A careful estimate of the waste, from this source alone, each year, is astonishing. Occasionally, it will happen that a miner will bury an extra heavy prop in the gob, rather than exert himself to stand it in place.

Allow me to suggest, in closing, that it would be well to frame a set of rules regarding timbering and post these in a conspicuous place at the mine. If this was done and the rule strictly enforced, it would go a long ways toward reducing the present unwarranted waste in mine timber.

Plains, Pa. RICHARD BOWEN.

Inquiries Of General Interest

Calculating Dimensions of Turnout or Crossover Switch

Need of Careful Calculation of All Dimensions of Switches—Track Gage and Size or Number of Frog to Be Used First Determined—Other Dimensions Calculated from These Data

SOME of the switches laid for turnouts in our mines have always given trouble; not so much by reason of derailment, for this has seldom happened in switching cars at turnouts. The chief trouble seems to be caused by lack of alignment and, as a result, the rails become worn and tracks need frequent repairs. After many trials, I have concluded that a track switch must be carefully calculated and laid out by exact dimensions.

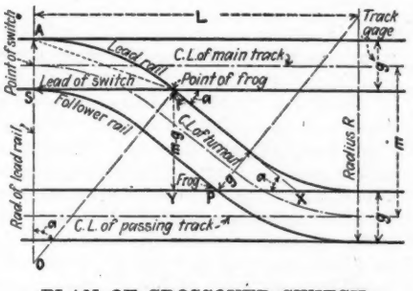
Kindly explain, through the columns of *Coal Age*, the essential requirements for making these calculations; and show the derivation of the formulas used. My purpose in asking this is to develop a standard switch and form of turnout, for use in our mine, where the track gage is 42 in. (3½ ft.). We are using No.-3 frogs in these switches and 30 lb. rails on the main road.

TRACKMAN.

———, Ill.

From the information given by this correspondent, we judge that his conclusion is correct and that the fault lies in the dimensions of the switch not conforming to other fixed data, such as track gage, number of frog employed and distance between track centers.

In designing a crossover switch similar to that shown in the accompanying



PLAN OF CROSSOVER SWITCH

diagram, assuming a given track gage (g) and frog number (n), the first step is to calculate the radius (R) of the lead rail, the length of its chord (c) and the exact position of the frog measured from the point of switch to the point of frog on the straight rail of the main track. This distance (d) is called the lead of the switch.

But, the angle AOF subtending the lead rail is, evidently, equal to the frog angle, and the chord ($AF = c$) corresponds to the spread of the frog for a distance $OF = R$. Then, since the frog number (n) is the ratio of one arm of the frog to its spread, we have $R = nc$.

Again, the angle AFS being half the frog angle and AS the track gage (g), it is clear that $2g$ is the spread of frog for a distance $AF = c$; and $c = 2gn$; which gives $R = nc = 2gn^2$.

Applying this formula to find the radius of lead rail, for a track gage $g = 3\frac{1}{2}$ ft., and using a No. 3 frog, we have

$R = 2gn^2 = 2 \times 3\frac{1}{2} \times 3^2 = 63$ *ft.*

For the length of chord subtending the lead rail ($AF = c$), we have

$c = 2gn = 2 \times 3\frac{1}{2} \times 3 = 21$ *ft.*

Approximately, the middle ordinate (o) of the lead rail, in inches, is found by dividing three times the square of the chord, in feet, by twice the radius, in feet, which gives, in this case,

$$o = \frac{3c^2}{2R} = \frac{3 \times 21^2}{2 \times 63} = 10\tfrac{1}{2} \text{ in.}$$

For the lead of switch ($SF = d$)

$$d = \sqrt{c^2 - g^2} = \sqrt{21^2 - 3\tfrac{1}{2}^2} = 20.7 \text{ ft.}$$

Total Length of Crossover

The next step is to find the total length (L) of the crossover, from switch point to switch point, as measured on the straight rails of either track. Calling the distance between track centers m, the distance between the gage lines of the inner rails of the two tracks is $m - g$. Then, calling the frog angle a, we have

$$YP = YX - PX = \frac{m - g}{\tan a} - \frac{g}{\sin a}$$

To calculate the frog angle, assume the spread as unity, which makes the length of each arm n, and we have, for a No.-3 frog,

$$\sin \tfrac{1}{2}a = \frac{\frac{1}{2}}{n} = \frac{1}{2n} = \frac{1}{2 \times 3} = \frac{1}{6} = 0.1667$$

or $\frac{1}{2}a = 9°\ 36'$ nearly; and $a =$ say $19°\ 11'$; $\tan a = 0.348$; and $\sin a = 0.3287$. Substituting these values in the formula previously given and assuming a distance between track centers $m = 8$ *ft.*

$$YP = \frac{8 - 3.5}{0.348} - \frac{3.5}{0.3287} = 2.28 \text{ ft.}$$

Since the same dimensions answer for both ends of the crossover, using the same frog number in each track, the

total length of the crossover or distance from point of switch to point of switch, as measured on the straight rail of either track, is

$L = 2d + YP = 2 \times 20.7 + 2.28 = 43.68$ *ft.*

At times it may be desired to use a fixed lead and find the frog number, or angle of frog, that will suit a given track gage. Then, since $c^2 = g^2 + d^2$; and $c = 2gn$, we have

$$n = \frac{\sqrt{g^2 + d^2}}{2g}$$

These are the essential switch formulas and by combining them it is possible to calculate the dimensions required to suit various conditions.

Examination Questions Answered

Mine Managers' Examination, Nova Scotia, 1922

(Selected Questions)

QUESTION—*How do you account for explosions frequently causing more damage in main intake roads than in returns and faces?*

ANSWER—A mine explosion, whether of dust or gas invariably produces the greater manifestation of violence in the direction of the intake air. The reason for this is that the combustion of the dust or gas requires air. On the return side of the explosion, the combustion is retarded, or may cease entirely for lack of air, the flame being extinguished in the products of the combustion, which always lack available oxygen. Because of the greater violence, due to the greater activity in the direction of the fresh air on the intake side, the damage is always greater in that direction than on the return side of the explosive wave.

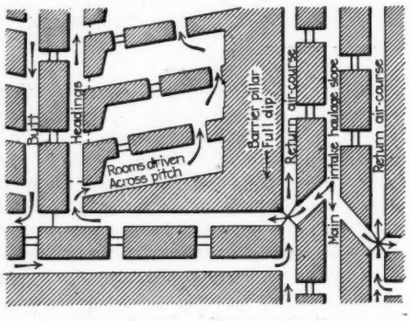
QUESTION—*Name as many as you can of the possible causes of underground explosions?*

ANSWER—An underground explosion results from the ignition of accumulated gas, or of a dust-laden atmosphere. The causes of the ignition are numerous and may be stated as: exposure to a naked lamp, or the flame of a blownout shot in blasting; or as the result of the sparking of electric wires; the blowing out of a fuse; or a spark struck by a miner's pick coming in contact with a sulphur ball or hard rock. There are instances recorded where explosions have resulted from gas being ignited by sparks due to certain flinty rocks falling from the roof. The ignition of gas by the spark of a miner's pick or falling rock is questionable.

Frequent causes of the ignition of gas, or a dust-laden atmosphere, are defective safety lamps; or the improper use of a safety lamp, in the hands of an incompetent person. A lamp that is improperly assembled, or its gauze dirty, or otherwise defective, is liable to pass flame through the gauze and ignite any gas or dust-laden air surrounding the lamp. When a lamp is exposed for too long a time to an explosive atmosphere the gauze becomes heated and the lamp is then unsafe and liable to cause an explosion if gas or dust is present in the air current. If a lamp is carried against a strong air current, or allowed to fall, or exposed to a sudden concussion of the air, it is liable to pass flame and ignite any surrounding gas or dust-laden air.

QUESTION—*Show, by a sketch, how you would arrange for the ventilation of a section of a gaseous mine pitching 35 deg., indicating by arrows the direction of the ventilating current in the airways and along the working faces.*

ANSWER—In the accompanying figure, is shown a section of a gaseous mine opened by driving the main slope headings three abreast, on the full dip of the seam. Cross-headings are then turned to the right and left of these slope headings and driven on the strike of the seam. Starting at a distance of 200 ft. from the main return air-course, butt headings are turned off the cross-entries and driven directly up the pitch, in pairs, leaving 100 yd. of solid coal between each pair of butts. As shown in the figure, rooms are driven to the right and left of each pair of butt headings, at a slight angle across the pitch, so as to assist the movement of the loaded cars in the rooms. The arrows indicate the direction of the currents.



QUESTION—*If you had a double-acting pump running at a piston speed of 90 ft. per min., the diameter of the plunger being 10 in., how much water per hour would it discharge; and what would be the sizes of the suction and discharge pipes to allow this pump to work at its best, assuming an efficiency of 85 per cent for the water-end of the pump and 231 cu.in. to the gallon?*

ANSWER—The sectional area of the plunger of this pump is $0.7854 \times 10^2 = 78.54$ sq.in. The plunger displacement, at a speed of 90 ft. per min. is $(90 \times 12 \times 78.54) \div 231 = 367.2$ gal. per min. The discharge of this pump, assuming an efficiency of 85 per cent for the water-end, is $0.85 \times 60 \times 367.2 = 18{,}727$ gal. per hr.

The diameter of the suction pipe, for this pump is $d = 0.35\sqrt{G} = 0.35\sqrt{0.85 \times 367} = 6.18$, say 6 in.

The diameter of the discharge pipe of the pump is $d = 0.25\sqrt{G} = 0.25\sqrt{0.85 \times 367} = 4.42$, say $4\frac{1}{2}$ in.

QUESTION—*What would be the safe working load for a steel hoisting rope ¾ in. in diameter?*

ANSWER—The breaking strain of a 6-strand, 19-wire, cast-steel, hoisting rope, 1 in. in diameter, is 34 tons. Then, since the strength of ropes of the same kind varies with the square of the diameter of the rope, we have for the breaking strain of a ¾-in. hoisting rope, $34(\frac{3}{4})^2 = 26+$ tons. The safe working load of this rope will depend much on the depth of the shaft in which it is used. For depths not exceeding 100 yd., a factor of safety of 5 can be used, making the safe working load, in that case, $26 \div 5 = 5.2$ tons. For greater depths, a larger factor of safety must be employed, say 8 or 10, for depths of 200 and 300 yd., respectively.

QUESTION—*A pair of winding engines with cylinders 30 in. in diameter, 5-ft. stroke, running at 40 r.p.m., steam pressure 40 lb. per sq. in., what would be the approximate horsepower?*

ANSWER—The sectional area of one cylinder, in this case, is $0.7854 \times 30^2 = 706.86$ sq.in. The total pressure on one cylinder is, therefore, $40 \times 706.86 = 28{,}274$ lb. For a 5-ft. stroke and a speed of 40 r.p.m., the piston speed is $2 \times 5 \times 40 = 400$ ft. per min. The power of a single cylinder, in this case, assuming an efficiency of 85 per cent is $0.85(28{,}274 \times 400) \div 33{,}000 = 291.3$ hp. The total power for the two cylinders is, therefore, $2 \times 291.3 = 582.6$ hp.

QUESTION — *What circumstances would guide you in deciding as to the quantity of air necessary for the ventilation of a mine?*

ANSWER—The volume of air circulating in a mine must first be sufficient to comply with the requirements of the state mining law. In addition to this, the volume must be sufficient and the air current so conducted as to sweep the working faces, in every part of the mine, and keep them free from gas and safe for work. The factors that decide the quantity of air required to accomplish this are the size of the workings; sectional area of the airways; thickness of the seam, as affecting the area of the openings through which the air currents pass and determining the velocity of the current. The velocity of the air must always be sufficient to act effectually in removing the gases that would otherwise accumulate in the workings.

National Coal Association Suggests Investigation of Seven Fundamental Points by Coal Commission

By Paul Wooton
Washington Correspondent of *Coal Age*

In a communication to the U. S. Coal Commission dated Nov. 10, in reply to a recent letter asking for suggestions "as to the best means of ascertaining the facts pertinent to the investigation into the bituminous industry," seven fundamental points are suggested by the National Coal Association as subjects to which the President's coal commission should give particular attention. They are:

1. The effect on production and on the price of coal, to the consumer, of the monopolistic and absentee control of mine labor.

2. The opposition of organized labor to the introduction of labor-saving machinery.

3. The non-observance by organized labor of contracts made on its behalf.

4. The existing prices of mining materials and supplies and a comparison between them and the prices existing prior to the war.

5. The existing freight rates and a comparison between them and the rates existing prior to the war.

6. The effect of inadequate transportation facilities on the production and the cost of coal.

7. The character and quality of the different coals, the uses to which they are put and the demand therefor.

The most careful attention was given by the National Association to this document. It was formulated from separate drafts presented by the different groups of operators. John W. Davis, former Ambassador to Great Britain and former Solicitor General of the Department of Justice, who has been retained by the association as its advisory counsel, assisted in the preparation of the document.

Alfred M. Ogle, president of the National Coal Association, met with the Brydon committee when the report was approved. At the close of the meeting he declared that coal operators generally are convinced that the President's commission is going to do a constructive piece of work. He said that the National Coal Association is more than anxious to co-operate with the commission in the most cordial and effective way possible.

The gist of the reply of the bituminous operators' special committee, composed of J. C. Brydon (chairman), J. G. Bradley, Michael Gallagher, Tracy W. Guthrie, George B. Harrington, E. C. Mahan and H. N. Taylor, is as follows:

This committee of the National Coal Association, and the bituminous coal operators co-operating with it, representing a preponderance of the tonnage of the industry, has received your letter of Oct. 24, 1922, on the subject of the approaching inquiry, and respectfully submits its reply. The committee appreciates this opportunity to present in advance the views of the bituminous operators and begs to assure the commission of its earnest wish and the wish of those whom it represents to lend to the commission every assistance in its power.

With this purpose in mind the committee comes without further preface to the task of making responsive answers to the concrete topics enumerated in the commission's letter, taking each by the number assigned to it and answering the commission's questions A and B with reference thereto, and thereafter turning to questions C, D, E and F.

1. *"Ownership and titles of the mines."*

We suggest that a list of all the coal operating companies, individuals and partnerships be secured from the U. S. Geological Survey and that a card be prepared and mailed to each of said operators asking them to fill out the same and return to the commission with the following information:

(1) List of mines operated, acreage of each and showing as to each whether operated as lessees or by owner of the fee, and if as lessee, the name of the lessor.

(2) Thickness and name of seam or seams and in what coal field and district located and served by what railroad, and at what shipping points.

(3) Whether operating under contract with United Mine Workers of America or not.

Since the sources of information and the methods of investigation in the union and non-union fields will necessarily be materially different, it seems to us that the first classification of mines made by your commission will be "union" and "non-union" mines, and we therefore recommend that this information be obtained by the first questionnaire sent out, and so we have included this with the request for information as to titles and ownership.

2. *"Prices of coal."*

This information may be obtained from each individual operator. We know of no common source which can supply it.

3. *"The organizations and persons connected with the coal industry."*

Literally speaking, this involves owners and all employees at each individual mine, the railway companies, selling agents, brokers, dealers, wholesale and retail, and delivery contractors, with the organization, personnel and employees of each, as well as ship and dock owners.

This information can be obtained in full only from the organizations and individuals above referred to. No doubt such organizations as the National Coal Association, the National Retail Coal Merchants' Association, the American Wholesale Coal Association, and the United Mine Workers of America can be of assistance.

4. *"Cost of production."*

(a) Since the methods of bookkeeping obtaining at different mines are divergent, we believe that the detailed reports required under this head should be consolidated to as few items as possible, consistent with obtaining the desired information, and we suggest the following: Labor, material and supplies, royalty, depletion, depreciation, general insurance, workmen's compensation or employers' liability insurance, taxes, including federal taxes assessed against the year's business in which the cost was incurred, general expense or overhead, interest or invested capital and miscellaneous charges.

(b) This information will be complete only if secured from all mines and may be obtained by a questionnaire as outlined in the method suggested for obtaining information as to ownership, and, to show the radical changes in cost, should cover a period of ten years. In coal fields where trade associations exist this information might perhaps be obtained through them.

5. *"Profits realized by operators or owners of said mines during the last ten years."*

(a) Transcripts of the profit and loss accounts amended as may be necessary to secure uniformity.

(b) Where not published, this information can only be obtained from the individual operator. To be of value it should be secured from all mines since profits realized depend not alone upon working conditions and physical surroundings but upon management, marketing and many other factors. One mine cannot fairly be taken in this respect as fixing a standard even for its neighbor.

No Suggestion on Obtaining Data on Profits

6. *"Profits of other persons or corporations having to do with production, distribution or sale of coal."*

(a) This would include the companies or individuals to whom royalties are paid. It would, also, include transportation companies, whether railroads or shipping, both on the Lakes and in the coastwise trade, together with incidental services rendered them by others. It, also, includes general selling agencies and brokers; dealers, wholesale and retail; and persons engaged in the business of delivering coal from the cars to the bins of the consumers, as well as those rendering them incidental service.

(b) We find ourselves unable to offer any suggestion as to how the information may be obtained, except from organizations and individuals mentioned.

7. *"Labor costs."*

(a) This is one of the details under Topic 4, and need not be further discussed here.

8. *"Wages paid."*

(a) Rates of wages paid can be obtained from copies of the wage scales for the past ten years. The commission should secure payrolls showing actual earnings. The running time of the mine during the period covered by the payrolls secured should also be obtained, together with the time worked by each employee as well as the tonnage produced.

(b) The wage scales and payrolls can be secured from the operators direct or from secretaries of trade associations.

In the consideration of this matter the attention of the commission is particularly called to the frequent failures of the employees to avail themselves of the opportunity to work, and steps should be taken to ascertain how much of the irregularity is voluntary on the part of the employee and how much of it is due to inability of the mine to run, either for lack of transportation or lack of orders, or mine disability. The commission is especially invited to make a careful comparison of wages paid in the coal industry with the wages paid for similar labor in other industries.

9. *"Wage contracts."*

(a) The commission should obtain copies of all wage contracts in effect during the past ten years. It should consider in this connection the history of such contracts, their making, observance and violation, and, where they provide for the collection of union dues and assessments, methods of such collection and the uses to which these large sums of money so collected have been put.

(b) This information can be obtained from the secretaries of the various trade associations in the different coal fields where these contracts have been obtained or from the officers of the United Mine Workers of America, at Indianapolis, Ind.

10. *"Irregular production."*

(a) The commission should obtain the tonnage and working time of each mine for a period of ten years, and the causes of all failures to work full time.

(b) This information may be obtained from the operators, and from the records of the U. S. Geological Survey.

11. *"Waste of coal."*

(a) This is a broad economic question, involving many different things, both as to production and consumption; such as, for instance, mining losses, from avoidable and unavoidable causes, stealage from railroad cars in transit, even before they reach the scales, which are sometimes several hundred miles from the mine, bad methods of handling in transshipment, and bad boiler practice and improper methods of use.

(b) As to mining losses, many operators have this information. Some information may be obtained from the U. S. Geological Survey and some from the land owners.

12. *"Suggestions as to remedies."*
Encouragement of the best mining methods on the part of all operators and miners, policing by the transportation companies to prevent stealage, and education of the public as to the proper methods of using coal, in industry as well as in domestic use.

13. *"The conditions, generally, under which coal is produced."*
The commission's investigation and the knowledge to be obtained under the various topics which it has outlined will enable it to make such response as it deems proper to meet the requirements of the act in this respect.

14. *"Distribution."*
(a) This would seem to involve a study of the markets, both industrial and domestic, the grades and kinds of coals demanded by each, the sources of supply—that is, the coal fields from which the different markets draw their supplies. It also involves a study of the transportation systems by which the coal is transported from the various fields to the various markets, which would necessitate obtaining information as to the amount of the trackage, the character and adequacy of rolling stock, and freight rates, and a determination of the effect of these various things upon the free flow of coal from the sources of supply to the markets. The commission should also ascertain the extent of and the reason for any failure of the transportation companies to transport all the coal offered for transportation to the various markets for a period of ten years.
(b) Sources from which to obtain this information would seem to be chambers of commerce, manufacturers' associations, trade associations, Interstate Commerce Commission, the railroads, and the U. S. Geological Survey. The selling, operating and distributing companies should also be able to give information.

How Distinguish Local from General Strikes?

15. *"The causes which from time to time induce strikes, thereby depriving interstate carriers of their fuel supply and otherwise interrupting the flow of interstate commerce."*
In discussing the causes which induce strikes it is necessary to draw a distinction between local strikes arising from local causes, and having a purely local effect, and those which, either in their character or their ultimate effect, are of a more general nature. Strikes occur from time to time at individual mines by reason of local causes. They are always an economic loss to the community in general and seriously affect the prosperity of the miners and operators involved, often bringing in their train poverty and financial loss. They are usually a breach of contract on the part of the miners and in certain districts have occurred with such frequency as to discredit the contractual relationship with the United Mine Workers of America, and put those districts at a competitive disadvantage, although they do not always have an appreciable effect on interstate commerce.
A strike, no matter how limited its area, becomes especially significant when it is induced by outside influences and prosecuted through motives unrelated to the purely local situation.
Such are the so-called local strikes which are from time to time set on foot by the United Mine Workers of America in the effort to spread its monopolistic control of mine labor throughout the country. Such strikes, though local in extent, are general in motive. There can be no doubt that the fundamental cause of such strikes, as well as strikes of a nationwide character, like those of 1919 and 1922, is the despotic control of approximately 60 per cent of the mine labor of the United States and Canada by a single organization with power to stop at will the production and movement in interstate commerce of approximately 60 per cent of the normal coal output of the country. The officers of this organization are for the most part remote from the coal fields and exercise what may justly be called an absentee control over its membership. They are supported by the enforced collection of union dues and assessments which reach a tremendous sum. They are impatient of all legal restraint, and insist upon freedom and immunity from the laws to which all other individuals and citizens must submit.
In the opinion of this committee, the continuation, to say nothing of any further extension, of the autocratic power of the United Mine Workers of America would be calamitous to the general welfare of the country and to the coal-mining industry. No investigation of the bituminous-coal industry can be called complete without the most exhaustive scrutiny of the methods and purposes of this organization, the means which have been adopted by it from time to time to further its ends, and the use which has been made of the enormous funds collected in its name.

16. *"And all facts, circumstances or conditions which would be deemed helpful in determining and establishing a wise and efficient policy by the government relative to said industry."*
Within the scope of this communication we find ourselves unable to respond to this inquiry by reason of its general character; but this committee repeats its willingness and desire to assist in the development of all facts which may in any way assist the commission.
The commission can get valuable information as to the alleged causes of strikes from the secretaries of the operators' associations in the various fields, some of whom have kept careful record of all interruptions of work and the causes thereof.

17. *"Standardizing the mines upon the basis of their economic productive capacity, and regarding the closing down of mines which, by reason of their natural limitations, or other conditions, fall below the standard."*
The phrase "economic productive capacity" seems to us too uncertain to be susceptible even of approximate definition.
We know of no way by which any mine may be closed down contrary to the wish of the owner except by the operation of economic laws. The closing down of so-called excessive-cost mines, we suggest, will be effectually accomplished by competition whenever the play of competitive forces is free from the interruption caused by strikes with their resulting panic among buyers and runaway markets.

18. *"Ascertaining and standardizing the cost of living for mine workers, and the living conditions which must be supplied or offered in order to surround the workman with reasonable comforts, and standardizing also, as far as practicable, the amount of work a man shall perform for a reasonable wage, recognizing the value and effect of such surroundings in respect to their efficiency."*
In our judgment, the cost of living cannot be standardized, nor can it be ascertained within any useful limits, for the factors upon which it depends are subject to constant change. Not only does it differ as a matter of fact from time to time in different coal fields and at the individual mines in each coal field but also among the miners themselves, depending upon the disposition and management of the heads of the families. In other words, some families live better than other families of the same size on the same or a lesser income.
Undoubtedly men are entitled to an opportunity to earn a fair and honest support for themselves and their dependents. The cost of such a living can be standardized, however, only when all the factors which enter into it can be separately standardized as well, and when individual appetities and desires and habits can be reduced to a like uniform rule.
As to living conditions which must be supplied or offered, in order to surround the workman with reasonable comforts, it is respectfully suggested that, under present conditions and conditions existing for some years past, the competition among employers for capable workmen has been such that, even aside from their desire to furnish proper working conditions and surroundings, they have been obliged to do so, in order to obtain and hold efficient employees.
It is suggested, however, that the commission might well make an investigation of representative communities in the various coal fields and elsewhere in order to determine what the living conditions of the workmen are as compared with those in other industries and in other centers of population, having reference, among other things, to cost of domestic supplies, size and kind of houses, cost of rent, electric lights, coal, water, medical service, nursing, and to school, church and recreational facilities.
Much of the work in and around coal mines is piece work, and the prices paid therefor are to a certain extent, standards. As to other work, it is of such varied character and done under such diverse conditions that standardization of any kind, as to the amount of work a man should do, is impossible.
We fully recognize that proper surroundings and living conditions are indispensable to both the happiness and efficiency of the employee, and the industry will welcome any suggestions which the commission may make looking to this end.

Standardization Declared to Be Difficult

19. *"Standardizing a basis of arriving at the overhead cost of producing and distributing the coal, including delivery at the door of the consumer, recognizing in this compilation that the standardized cost of living to the miners should be the first and irreducible item of expense."*
The principle governing the determination of what may properly be included in "overhead" is that there shall be included therein those fixed charges which continue constant irrespective of the volume of the business. Such charges are not subject to the fluctuations which characterize the items of cost hereinbefore alluded to and are not affected by variations in production. They fairly embrace costs of management, office expenses, interest on borrowed money, insurance, taxes and expenses incident to the organization as such. Standardization of such items if not wholly impossible, presents obvious difficulties.
As to standardizing the cost of delivery at the door of the consumer, attention is called to the fact that the cost necessarily varies for many reasons even for identical service in different parts of the country, so that it seems to us impossible to approximate any standardization. The dealers of the country can undoubtedly give the commission light on this complex question.
We now take up your questions (c), (d), (e) and (f).
(c) *"What, if any, topics should the commission investigate, in addition to those already enumerated in the law, in order to give to Congress and the public complete information necessary to the proper understanding of the conditions in the coal industry?"*
Since the creation of this commission was, unquestionably, due to the recent interruption of the supply of coal to the consumer, and its effect on prices, which in turn was due to the enforced closing of many of the mines during the past summer, we respectfully suggest that, because they strongly influence these prices, the commission should make investigation, in addition to these prescribed by the statute, of the following subjects:
(1) The effect on production and on the price of coal, to the consumer, of the monopolistic and absentee control of mine labor in the United States.
(2) The opposition of organized labor to the introduction of labor-saving machinery.
(3) The non-observance by organized labor of contracts made on its behalf.
(4) The existing prices of mining materials and supplies and a comparison between them and the prices existing prior to the war.
(5) The existing freight rates and a comparison between them and the rates existing prior to the war.
(6) The effect of inadequate transportation facilities on production and cost of coal.
(7) The character and quality of the different coals, the uses to which they are put, and the demand therefor.
(d) *"To what extent are you in position to co-operate with the commission in securing necessary data in such manner as will eliminate, in the largest possible degree, any basis for criticism of the accuracy or the validity of the data when secured?"*
The National Coal Association by this committee as its representative desires to co-operate with you to the fullest extent in its power, and to that end will use all the influence which it has with those whom it represents. However, as a voluntary organization it has no power to compel the giving of information. It may be well to state in this connection that the bituminous coal industry is a highly competitive business. The individual operators have always carefully guarded from each other the details of their business and have been advised that under existing legal prohibitions the interchange of information and its compilation by a central bureau might expose them to criticism. The association, therefore, is without any statistical information immediately available for the use of the commission.
In the interest of accuracy all information should be collected and compiled by separate districts. In those districts where both union and non-union mines are encountered a separate classification should be made for each.
(e) *"What, in your judgment, are the elements that have caused, and are causing the acknowledged demoralization in the coal industry and which are working hardship alike upon the parties engaged in the production of coal and the consuming public?"*
In our judgment, the bituminous-coal industry cannot fairly be said to be in a condition of "acknowledged demoralization." In spite of the recent difficulties, the industry in the main is neither unwisely nor inefficiently conducted and the service rendered to the public will, we believe, compare favorably with that of other industries in the country. Undoubtedly the industry still suffers in common with the entire commercial structure of the country from the disturbances and dislocations caused by the war. Prior

to the war, while strikes had occurred from time to time, it is fair to say that the country had never known distress or anxiety concerning its supply of bituminous coal.

The regulations brought about by the war and the governmental control to which the industry was then subjected disturbed its normal functioning. Inevitable concessions were made to labor in the matter of wages and working conditions, which, while perhaps appropriate in the circumstances then existing, should not continue now that the country is adjusting itself to a peace basis. The realization of this fact not only by the operators but by the employees and by the public, as well, is indispensable to the health of the industry. Above all things else, the industry needs a period of tranquillity and freedom from governmental interference or control. Time and the natural operation of economic laws can accomplish more for all concerned than any artificial efforts, either statutory or otherwise.

Such difficulties as exist we believe to be primarily due to the following elements:

(1) The monopolistic control of mine labor by absentee union officials.

(2) Nationwide as well as local strikes brought about by an irresponsible and autocratic organization.

(3) Lack of adequate railroad service and transportation.

(4) Unnecessary and uninformed competition among the buyers of coal.

(5) Appeals by agitators and propaganda of different kinds designed to breed dissatisfaction and create unrest among the people at large. It is earnestly hoped that the report of this commission will terminate once for all the misrepresentations on which these appeals are based.

(f) *"What in your judgment are the practical remedies which would eliminate any or all of the elements which you feel are responsible for the conditions?"*

We note with reference to the above query, as well as to the one which preceded it, that the commission, in suggesting that it be answered at some date in the near future, and then only tentatively, appreciates the difficulties which surround any effort to make a categorical response. The undersigned are not prepared at the moment to return any other than a general reply, reserving the right with the consent of the commission to amplify their views as the investigation proceeds.

In any discussion of remedies, however, we believe that there are certain basic principles which cannot be ignored, and which must condition any consideration of remedies. Among these principles are the following:

First—That every man has a right to work without either interference or compulsion when, for whom and upon such terms as he may see fit.

Second—That while the right of workers to organize for legitimate purposes cannot be denied, such organizations have no right to impede or restrain those who do not care to join or to deal with them.

Third—That the right of private property is and must remain inviolable.

Fourth—That in the last resolve, the law of supply and demand always has and always will determine prices; that no legislation can long interfere with this inexorable rule; that any interference can only be justified, if at all, in time of war; and that at any other time it will inevitably produce greater evils than those which it seeks to suppress.

Instead, therefore, of seeking remedies of a character which are foreign to the genius and spirit of our American institutions, as well as doubtful from the point of view of economics, we submit that a discussion of remedies should be directed to the two things most needed in the coal industry.

These are:

First—Adequate transportation.

How far the questions here involved are within the scope of this inquiry is, of course, for the commission to determine. The coal industry in the United States cannot prosper without a continuous, regular and adequate supply of the means of transportation. The railroads of the country should be given sufficient freedom, independence and revenue to enable them to obtain the money necessary to provide proper equipment and other facilities to meet their increasing business. They should be regulated only to an extent necessary to insure the proper use and distribution of these facilities when obtained.

Second—Freedom from labor troubles artificially provoked.

No organization or combination of persons, either natural or corporate, should be permitted to hold itself above and superior to the law. There is no room in this country for the doctrine of irresponsible power. The United Mine Workers of America and all like organizations should be subject to all statutes passed for the public good, and, specifically, to those forbidding the intentional restraint of interstate commerce; and any action taken by that or like organizations, the necessary result of which must be to restrain, destroy or impede interstate commerce, should be presumed in their case, as in that of others, to have been taken with that intent.

In soliciting the right to make such further communication to the commission as may seem expedient we renew the offer of such assistance as may lie within our power.

Bituminous Shortage Now Thought Unlikely; Some States May See Anthracite Scarcity

The stock report issued by the Federal Fuel Distributor discloses an unexpectedly large accumulation of bituminous coal. It demonstrates that the country came through the emergency with larger reserves than even the highest estimates. The report carries rather impressive confirmation of the experience in 1920 that the market becomes panicky when stocks begin to reach the 20,000,000-ton level. It now is clear that stocks were reaching that mark this year when the situation became acute and H. B. Spencer was called in to handle distribution. With this confirmation, it is being assumed by federal officials that 20,000,000 tons is the danger line.

The report shows that stocks had increased to 28,000,000 tons by Oct. 1 and, according to Mr. Spens' estimate, aggregated 35,000,000 tons on Nov. 1. The general opinion is that this estimate is entirely reasonable.

The steady gain in the output of bituminous coal indicates that with good management the country will be able to go through the winter with no serious shortage of steam coal. The stock report shows, however, that the process of substituting bituminous coal for anthracite had not proceeded far on Oct. 1. Retailers had increased their deliveries of bituminous coal in anthracite-consuming territory, but the increase was not sufficient to make up for the decrease in the amount of anthracite that would be available. The figures showed that the total deliveries of both anthracite and bituminous coal were less this year than last. A careful study of the figures reveals that in some states the work of substitution had gone further than in others. Substitution was further advanced in Rhode Island, New York, New Jersey and the District of Columbia. This is believed to be a direct reflection of the policy of local fuel administrators to urge substitution. It is predicted that as a result of this forehanded policy those areas will be spared the difficulties certain to come in other areas during the next five months.

The problem of domestic supply in those localities which will not receive their regular quotas of anthracite is believed to be largely one for local solution, which must be worked out through co-operation of retailers with local authorities. This winter, it is generally believed, will give a splendid demonstration of the indispensable service which the retailers perform in the distribution of coal. Officials believe that an unusual opportunity will be presented for the retailers to do a great public service and demonstrate that much of the criticism which has been hurled at them is not justified.

Recrudescence of National Coal Association Seen in Joining of Indiana Operators

The Indiana Bituminous Coal Operators' Association has filed an application for membership in the National Coal Association. This will bring into the latter association all operations in the State of Indiana. Under the conditions existing previously when Indiana was represented in the National Coal Association by the three coal trade bureaus, 40 per cent of the state's tonnage was unrepresented.

This action, together with the fact that the Illinois operators and those in the Pittsburgh district recently have been co-operating with the association in important matters, leads to the belief that the National Coal Association soon will be stronger and more representative than ever before.

Some are of the opinion that the action of the Indiana operators foreshadows a similar course on the part of those in Illinois. It is known that the more substantial operators in Illinois are fully aware of the essentials of a truly representative national organization.

A new recognition of the importance of the National Association is in evidence in all of the fields which have membership. It is declared by association officials that an exaggerated importance was given the defections in membership which followed the Indianapolis indictments and the Supreme Court's decision in the Hardwood case. Since those developments affected adversely many of the organizations holding membership in the National Coal Association, there naturally was uncertainty until new bases of national representation could be worked out.

J. D. A. Morrow will be relieved of his duties as vice-president of the National Coal Association on Dec. 1 so that he may devote his entire time after that date to the newly formed coal-brokerage firm of which he is president. No successor for Mr. Morrow has been chosen as yet. Since the success of the organization depends to such a great extent on the vice-president in charge of the Washington office, the committee charged with the selection of that official expects to take whatever time may be necessary to find the best available man qualified for the position.

Three Central Pennsylvania Operators' Associations Amalgamate

The Central Coal Association, the Central Pennsylvania Coal Producers' Association and the Association of Bituminous Coal Operators of Central Pennsylvania were amalgamated at a joint conference of directors of the three associations held in Altoona Nov. 9.

The Central Coal Association and the Association of Bituminous Coal Operators merged under the name of the Association of Bituminous Coal Operators of Central Pennsylvania and all the members of the merged bodies became members of the Central Pennsylvania Coal Producers' Association. This action will give the operators in this region one of the strongest organizations in the United States.

The Producers' Association will have charge of such matters as traffic, car supply and the collection and dissemination of statistics and various information of interest to the members. It will have nothing whatever to do with matters pertaining to labor problems. The Association of Bituminous Coal Operators will have but one purpose, the negotiation of and the enforcement of wage agreements between the operators employing union labor and the United Mine Workers.

The general officers of both associations are the same under the terms of the amalgamation, as follows: President, B. M. Clark, Indiana; Vice-President, G. Webb Shillingford, Clearfield; Secretary-Treasurer, Charles O'Neil, Altoona; Commissioner, John C. Forsythe, Clearfield; Statistician, W. A. Jones, Altoona.

The executive board of the Association of Bituminous Operators will be B. M. Clark, Indiana; Rembrandt Peale, New York; J. R. Caseley and E. H. Robertson, DuBois; C. B. Maxwell, Morrisdale; H. B. Scott and J. William Wetter, Philipsburg; Thomas F. Kelley, Coalport; G. Webb Shillingford, Clearfield; J. S. Sommerville, Robertsdale; William Lamont, Elmora; J. A. Boucher, Beaverdale; Harry Boulton, Clearfield; S. T. Brown, Indiana, and M. J. Bracken, Johnstown.

The board of the Producers' Association is composed of the following: Tyrone group, J. W. Wetter; Clearfield group, R. H. Sommerville; South Fork group, M. J. Bracken; Barnesboro group, James H. Allport; Tioga group, E. H. Robertson; Broad Top group, J. S. Sommerville; Punxsutawney group, W. R. Craig; Directors at large, G. Dawson Coleman, Philadelphia; D. T. Price, Windber; Charles A. Owen and Rembrandt Peale, New York; B. M. Clark, Indiana; J. R. Caseley, DuBois; James B. Neale, Minersville; J. W. Shillingford, Clearfield; W. S. Blaisdale, Punxsutawney; Fred B. Kerr, Clearfield; C. B. Maxwell, Morrisdale; Harry Boulton, Clearfield, and S. T. Brown, Indiana.

Toll of Lives in Reilly Mine Disaster, At Spangler, Pa., Is Seventy-Seven

Seventy-seven lives were lost in the Spangler, Cambria County, mine disaster of Nov. 6, according to the official figures announced by Seward Button, head of the state Bureau of Mines of Pennsylvania, who has been in charge of the investigation and who has completed an exhaustive checking up of the Reilly company's payroll and the weighmaster's list of miners.

Mr. Button's report states that 108 men entered the mine the morning of the explosion. Following the explosion, six escaped unaided, twenty-nine were rescued and taken to the hospital and seventy-three dead bodies were taken from the mine. Four of those taken to the hospital died and five more are in a critical condition.

Following a conference with the mine officials, who had requested time to put the mine in condition to enter in order to facilitate the work, Mr. Button appointed the following commission to make a thorough inspection: W. D. Wardrop, district inspector; Thomas Lowther, Indiana; Charles Crocker and T. D. Williams, Johnstown; Thomas Mather, Tyrone, and Joseph Williams, Altoona.

Thursday, Friday and Saturday were given over to the funerals of the deceased miners. Relief work for the families of the stricken miners has been started and is receiving whole-hearted support. The Red Cross has opened welfare stations and the people of Johnstown, Altoona and the smaller towns in the district and the various coal companies throughout the district are giving freely of money and other necessities. The United Mine Workers has contributed $10,000 for relief work at Spangler. Of this amount $5,000 came from the international organization at Indianapolis and $5,000 from District No. 2, at Clearfield.

The relief committee is composed of John Mayholtz, an organizer for the U.M.W.A.; James McGlenn, president of the Spangler local of the U.M.W.A.; A. E. Fox, president of the Spangler chapter of the Red Cross, and Mrs. Harry Blair and Mrs. W. R. Davison.

After a two-day investigation of the mine, Chief Seward Button attributes the explosion to methane gas. In a preliminary report, Mr. Button stated the actual explosion was slight and but few men were killed in that manner. Most deaths were due to the presence of after-damp and the inability of the men to reach fresh air. The inquest will be held early this week.

George S. Rice, chief mining engineer of the U. S. Bureau of Mines, and J. W. Paul will make a special investigation of the disaster for the Bureau of Mines.

Ohio Administrator Allows Advance of 50c. in Price of Domestic Sizes

Late last week the Ohio Fuel Administrator authorized an increase of 50c. in the fair-price schedule for "coal in sizes specially prepared and particularly cleaned for individual purposes." This increase is made in order to assure to Ohio users a fair percentage of the lump produced within the state which has been going to outside purchasers. According to Administrator Neal the former fair-price list took into consideration only actual cost of production without allowing for labor operations necessary for special preparations. The administrator also authorized the new Pocock Coal Co. and Howells & Fox, coal operators in the Massillon field, to raise their mine price from $4.86 to $5.11 because of high cost of production.

All specially prepared domestic coal coming within this order will be priced from $5.06 to $5.61 under the new ruling. The price in the Hocking Valley proper, including Hocking and Athens counties and Monroe township, in Perry County, will be increased from $4 to $4.50 while the Bailey Run, or No. 7, seam will be increased from $4.59 to $5.09.

Ohio Coal Companies Seek to Enjoin State Control of Fuel

A sweeping injunction which, if granted, will tie up all of the machinery of the State Fuel Administration and stop, temporarily at least, all efforts to enforce coal price regulation in Ohio, is asked in a suit filed Nov. 8 in U. S. District Court at Toledo. The Ohio Collieries Co. and the George M. Jones Co., two Toledo companies which control sixteen mines in the southern Ohio field, seek the injunction.

The bill of complaint attacks the constitutionality of the emergency act passed by the Legislature late in the summer providing for the appointment of a fuel administrator and state regulation of the price of coal.

The bill names Roy R. Stuart, prosecuting attorney of Lucas County; Governor Harry L. Davis and Attorney General John G. Price. After receiving the petition for the injunction, Judge John M. Killits announced that he would take no action relative to a hearing until he had conferred with the other District Court jurists as to the legality of the procedure.

As the bill attacks the constitutionality of a statute of the state, the hearing upon the application for a temporary injunction and the final hearing upon the merits must be before a court consisting of three United States Judges.

The bill declares that the Ohio Collieries Co. cannot operate its mines at a profit at the price fixed by the Ohio Fuel Administrator.

Operators Offer Two Wage Plans at Chicago Conference; Lewis Has No Definite Proposal

When the joint committee of operators and miners assembled in Chicago Tuesday, Nov. 14, to begin its efforts to work out a wage plan for the future it had before it at least one definite suggestion. Harry Taylor, of the Southwest Interstate Association, proposed a scheme whereby wages by districts could be varied from a "national base rate" according to local conditions, and setting up joint boards to adjudicate disputes and a supreme council for appealed cases. This plan put the outlying districts in the position of presenting something constructive as a contribution at the first national conference of the sort to which they had ever been admitted.

Preceding the conference there was a quite general sentiment that a strong national organization of operators to deal with the miners' union should be formed at once and steadfastly supported when the meeting started. Nobody knew what it would do after its organization nor how long it would run.

Every one of the fifteen districts represented at the Cleveland conference a month ago, which arranged the Chicago meeting, had its delegates in Chicago when the session opened. No other regions asked admittance after the Cleveland organization was made permanent with Phil Penna as chairman and William Green, of the miners, and E. G. Edwards, of the operators, as secretaries. Little was done at the morning session except receive credentials before adjournment at noon.

One dispute arose when both Joseph Purseglove and M. E. Watson, president of the Monongahela Coal Association, claimed to be official delegates. Purseglove was the man representing several large producers of that field at Cleveland but Watson put in his claim on the basis of his selection by the Monongahela Coal Association on Nov. 9. The dispute went to secretaries Green and Edwards. Mr. Purseglove was not in Chicago because of an accident suffered by his daughter but his case was put in by his brother, Sam Purseglove. The two secretaries, unable to reach an agreement, laid the case before the conference when it convened for the afternoon session.

W. L. Jenkins, of Fairmont, W. Va., read to the operators a plan for national agreements to be made by a nationwide conference committee.

At the afternoon session both Purseglove and Watson were accepted as delegates, each with half a vote. This was not expected to cause confusion because each district must vote as a unit.

The miners remained but three minutes in the afternoon meeting, retiring after President John Lewis said he had no definite proposal to make. The operators then spent all afternoon discussing the plans proposed by Mr. Taylor and Mr. Jenkins, reaching no agreement on them and giving no publicity to either but referring both to a committee to report Wednesday.

It was hoped Lewis would have something definite to propose by Wednesday's joint session. Tuesday night he said he was waiting for the operators. Thus the first day accomplished little. When Mr. Lewis was asked if the conference might wait for the Federal Coal Commission to produce a wage plan he smiled and said there wasn't much use expecting anything.

Preliminary Statistics of Production of Coal in 1921

(Exclusive of product of wagon mines)

Pennsylvania

County	Loaded at Mines for Shipment (Net Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees — Underground — Miners, Loaders etc. (a)	Underground — All Others	Surface	Total	Average Number of Days Worked
Allegheny	10,513,579	1,201,262	216,064	622	11,931,527	$34,877,000	$2.92	13,992	4,420	2,662	21,074	146
Armstrong	3,026,839	212,159	149,764	.....	3,388,762	10,369,000	3.06	4,784	1,713	1,080	7,577	121
Beaver	121,073	40,306	30	.....	161,409	413,100	2.56	180	27	73	280	195
Bedford	201,099	43,178	8,885	64,082	317,244	1,052,000	3.32	749	272	139	1,160	81
Blair	73,418	18,161	565	.....	92,144	286,000	3.10	220	66	35	321	106
Bradford, Fulton, Lycoming and McKean	50,369	4,492	435	.....	55,296	203,200	3.67	88	24	26	138	137
Butler	856,061	50,918	16,412	.....	923,391	2,366,000	2.56	1,434	409	326	2,169	129
Cambria	14,541,992	1,061,642	212,839	522,755	16,339,228	49,769,000	3.05	16,873	4,952	2,788	24,613	165
Center	691,723	69,740	3,531	.....	764,994	2,334,000	3.05	1,538	384	253	2,175	111
Clarion	1,151,474	79,749	17,071	.....	1,246,294	3,495,000	2.80	1,917	556	346	2,819	151
Clearfield	5,486,633	209,543	115,540	42,206	5,853,922	16,691,000	2.85	8,705	2,487	1,477	12,669	143
Clinton	59,571	23,560	510	.....	83,641	252,000	3.01	192	61	65	318	75
Elk	838,947	21,968	17,286	.....	878,201	2,705,000	3.08	1,517	295	234	2,046	167
Fayette	13,799,565	234,090	630,965	4,596,158	19,260,778	46,041,000	2.39	11,960	9,323	4,901	26,184	150
Greene	2,228,672	20,956	45,173	.....	2,294,801	5,935,000	2.59	1,414	804	637	2,855	244
Huntingdon	428,373	8,462	16,181	30,992	484,008	1,641,000	3.39	1,051	243	146	1,440	123
Indiana	5,964,908	108,353	153,562	131,148	6,357,971	18,431,000	2.90	8,859	2,786	1,735	13,380	131
Jefferson	2,318,151	74,490	142,294	172,959	2,707,894	8,160,000	3.01	4,045	1,157	789	5,991	132
Lawrence	174,157	9,601	9,899	.....	193,657	584,000	3.01	189	90	42	321	274
Mercer	450,783	4,504	24,600	.....	479,887	1,414,000	2.95	554	263	146	963	171
Somerset	8,623,857	195,061	156,891	.....	8,975,809	26,021,000	2.90	8,730	2,732	1,670	13,132	173
Tioga	410,859	17,551	9,292	.....	437,702	1,720,000	3.93	833	187	195	1,215	166
Washington	14,169,333	245,336	214,845	87,470	14,716,984	38,954,000	2.65	15,242	4,915	2,667	22,824	144
Westmoreland	15,843,904	360,508	389,738	1,472,248	18,066,398	48,825,000	2.70	14,752	6,238	3,989	24,979	164
Total	102,025,340	4,315,590	2,552,372	7,120,640	116,013,942	$322,538,300	$2.78	119,818	44,404	26,421	190,643	151

South Dakota

County												
Dewey and Harding	450	1,441	.....	.....	1,891	$4,800	$2.54	16	.....	.....	16	139
Meade and Ziebach	.....	791	.....	.....	791	2,300	2.91	66	.....	.....	6	83
Perkins	.....	4,137	34	.....	4,871	14,100	2.89	21	.....	.....	21	135
Totals	450	7,069	34	.....	7,553	$21,200	$2.81	43	.....	.....	43	129

Tennessee

County												
Anderson	317,207	8,944	7,265	.....	333,416	$987,000	$2.96	599	269	172	1,040	117
Campbell	989,685	23,877	30,475	.....	1,044,037	4,073,000	3.90	1,517	582	448	2,547	159
Claiborne	818,533	9,327	20,165	.....	848,025	2,872,000	3.39	702	344	202	1,248	189
Fentress	380,493	4,935	9,466	.....	394,894	1,156,000	2.93	408	84	95	587	140
Grundy	363,509	1,610	1,918	19,727	386,764	1,296,000	3.35	637	247	144	1,028	161
Marion	256,782	4,299	7,603	.....	268,684	787,000	2.93	271	119	144	534	172
Morgan	261,321	1,208	12,389	21,500	296,418	1,042,000	3.51	387	253	114	754	210
Overton	153,164	1,589	1,199	.....	155,952	555,000	3.56	175	41	34	250	118
Scott	106,034	7,212	590	.....	113,836	327,000	2.87	203	59	68	330	160
Other Counties (b)	547,636	25,198	32,660	12,806	618,300	1,837,000	2.97	1,162	502	365	2,029	121
Totals	4,194,364	88,199	123,730	54,033	4,460,326	$14,932,000	$3.35	6,061	2,500	1,786	10,347	154

(a) Includes also shotfirers. (b) Bledsoe, Cumberland, Hamilton, Rhea, Roane, Sequatchie and White. Statistics compiled by L. Mann, U. S. Geological Survey Oct. 28, 1922.

Union Miners to Be Assessed $2,000,000

A special assessment on members of the United Mine Workers of America which is expected to yield to the union's treasury at least $2,000,000 is announced by John L. Lewis, International president.

While reluctant to discuss the possibility of another strike, Mr. Lewis said that the miners would not accept any wage reductions on April 1, when the present agreement in the bituminous coal fields expires. The union demands continuation of the present wage scale for another two years.

Mr. Lewis said that coal production was being speeded up throughout the country and was being limited only by transportation facilities. Virtually all the miners in the unionized districts, he said, were working, but there were still 73,000 miners out on strike in the non-union coal fields.

"Never before in its history was the miners' union in better condition than it is today, although the battle with the non-union operators continues to be waged all around our borderland," said Mr. Lewis, "and all the fighting is being done on the enemy's territory.

"We are taking care of the financial situation by levying a special assessment of $4 per member, to be paid in two instalments of $2 a month."

Coal Miners Remain Idle Rather Than Work in Metal Mines

Metal mines in the Butte district are in urgent need of no less than 3,500 men, according to reports to federal officials. As there are several hundred men awaiting work at coal mines in Wyoming, an effort has been made to induce the unemployed in the coal fields to accept positions at Butte, but since the wages in the coal mines are so much higher, the men in most cases prefer to stay at the coal mines and take the chance of employment developing. Reports from Eastern coal mines indicate that men are applying for work in much larger number than they can be employed.

Much Legal Jockeying Marks Early Stages Of Trial in Herrin Massacre Case

Trial of men indicted for murder in connection with the Herrin massacre in Williamson County, Illinois, is getting under way amid difficulties. Most of the men in the venire of 130 avoided jury duty in the case on one excuse or another as a starter. When the Attorney General moved to *nol prosse* the indictments against 41 of the 46 men the grand jury held for the murder of Howard Hoffman, A. W. Kerr, chief counsel of the defense, employed by the miners' union, insisted that a jury be impaneled at once and instructed to find the 41 "not guilty" and to release them. The objection was overruled and 5 men of the original 46 will stand trial for Hoffman's death as soon as the jury is chosen.

Then the defense moved for a continuance of the case to the next term of court, but Judge Hartwell insisted that as both sides originally said they would be ready now, the trial should proceed. Next the defence moved that all the indictments be quashed on the ground that the grand jury that returned the indictments was selected by sheriff's deputies instead of by the sheriff himself, that 26 jurors instead of 23 were summoned and that the jury had been unduly influenced during the deliberations by statements printed in the newspapers. Judge Hartwell reserved decision.

Attorney Kerr for the miners demanded the right to question the prosecution as to the source of the funds which private organizations have put into Attorney General Brundage's hands, in lieu of state funds which are not available because Governor Small cut so deeply into the Attorney General's appropriation. Judge Hartwell denied this motion. With the removal of all objections and motions tending to delay the trial, the case is ready to proceed. Early this week it was thought that the choosing of the jury would be resumed. How long it will take to impanel a full jury remains to be seen. Frank Farrington, president of the Illinois district of the United Mine Workers of America, and State Senator W. L. Sneed, a subdistrict president, are both in attendance at the trial.

Coal Roads Announce Further Plans for Improving Their Freight Facilities

The Louisville & Nashville R.R., which to Nov. 1 had reported contracts of over $20,000,000 placed this year for road improvements, cars, engines, etc., has since announced contracts placed for 3,000 more cars, including 2,000 coal cars, to be delivered by April, 1923, these to be all steel cars. The road contracts the 3,000 cars at $5,750,000. At present the L. & N. has 27,750 coal cars and 17,750 box cars. W. L. Mapother further announced that he plans to spend a total of $52,000,000 in 1922 and 1923 in improving facilities of the road for handling traffic, which should bring relief to many shippers.

On Nov. 6 announcement was made that the Chicago, Indianapolis & Louisville R.R. (Monon) was spending $725,000 for 300 steel coal cars, 7 locomotives and 4 steel coaches. The Illinois Central R.R. also has filed a trust agreement at Frankfort, Ky., under which a mortgage agreement is uncovered with the Commercial Trust Co., of Pennsylvania, whereby the road is to receive money for purchase of $8,310,000 worth of equipment, including 3,000 steel coal cars, 50 road engines and 15 switch engines.

Professor Willitts to Probe Wage Facts For U. S. Coal Commission

Fact-finding with regard to wages and earnings of mine workers will be done by Prof. Joseph S. Willitts, of the University of Pennsylvania, for the President's coal commission.

Since the commission has committed itself to await suggestions from the various branches of the coal business before formulating its own plan of action, no great amount of progress has been made during the past week in the formulation of its plans. The week has been spent, however, in informal conferences and consideration of the data which its staff already is laying before it.

A plan is being worked out whereby all material submitted by outside sources will be carefully checked so that the commission will be in a position to underwrite any of the facts and figures which it may care to use.

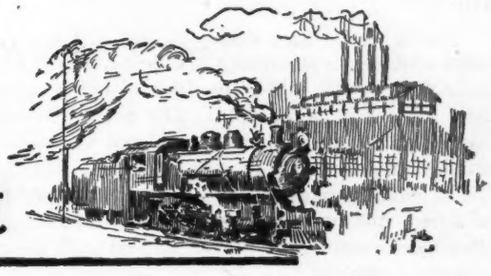
Lake Coal Loadings During Season to End of October*

(In Net Tons)

Ports	Railroads	1922 Cargo	1922 Fuel	1922 Total	1921 Cargo	1921 Fuel	1921 Total	1920 Cargo	1920 Fuel	1920 Total
Toledo	Hocking Valley	2,820,504	81,750	2,902,254	4,079,150	107,350	4,186,500	3,344,832	73,820	3,418,652
	Toledo & Ohio Central	631,551	18,225	649,776	1,027,438	29,667	1,057,105	1,508,792	56,183	1,564,975
	Baltimore & Ohio	2,483,345	64,600	2,547,945	2,354,369	72,016	2,426,385	1,337,880	38,948	1,376,828
Sandusky	Pennsylvania	2,165,807	80,493	2,246,300	1,552,971	45,076	1,598,047	1,418,843	21,775	1,440,618
Huron	Wheeling & Lake Erie	299,292	12,684	311,976	1,491,595	42,905	1,534,500	1,641,441	84,893	1,726,334
Lorain	Baltimore & Ohio	1,214,512	68,567	1,283,079	2,393,742	97,034	2,490,776	2,735,633	171,290	2,906,923
Cleveland	Pennsylvania	784,011	77,677	861,688	1,990,664	86,325	2,076,989	1,054,953	151,469	1,206,422
	Erie	238,475	9,127	247,602	359,981	12,782	372,763	364,048	17,486	381,534
Fairport	Baltimore & Ohio									
Ashtabula	New York Central	1,073,415	68,697	1,142,112	1,064,824	59,124	1,123,948	1,351,849	246,548	1,598,397
	Pennsylvania	1,134,222	71,730	1,205,952	2,213,665	72,753	2,286,418	1,662,618	83,858	1,746,476
Conneaut	Bessemer & Lake Erie	1,153,334	46,733	1,200,067	1,362,601	18,258	1,380,859	2,105,250	35,516	2,140,766
Erie	Pennsylvania	159,461	60,739	220,200	979,869	61,103	1,040,972	564,688	90,402	655,090
Totals		14,157,929	661,022	14,818,951	20,870,869	704,393	21,575,262	19,090,827	1,072,188	20,163,015

* Compiled by Ore & Coal Exchange, Cleveland, Ohio: H. M. Griggs, Manager.

Production and the Market



Weekly Review

Conditions in the coal market are slowly improving. The trade shows an urgent need for a cold snap, but in spite of unseasonable temperature and other deterrent factors, prices are being held more and more firmly. *Coal Age* Index of spot bituminous coal prices dropped 4 points to 340 on Nov. 13, as compared with 344 in the week previous. This corresponds to an average mine price of $4.12 and is a decline of only 8c. since Nov. 1. During October the average spot price dropped 70c.

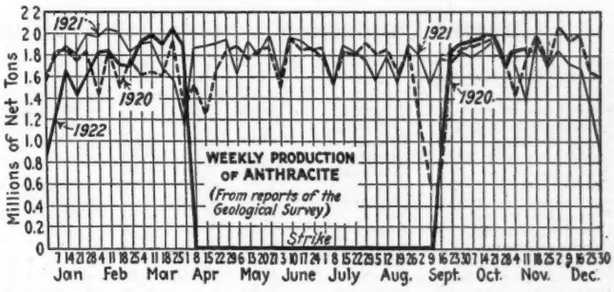
There are plenty of inquiries in the spot market and undoubtedly many users are quietly accumulating reserves. The heavier output is being sold with less difficulty, although the volume of spot offerings has not increased in like proportion. Much coal is moving to contract connections and the trade prefers to hold its free coal on the open market so but few new contracts are reported. High-grade fuels are eagerly sought, but the supply is very limited. Naturally this has improved the position of the medium and low qualities, although the market is still far from a "coal-is-coal" basis. The railroads are actively acquiring tonnage and much criticism is directed toward the carriers' system of preferential car supply for their needs. Operators assert that their commercial placements are so meager that they are unable to accept new business for delivery at an early date.

Rush Movement to Lakes Reduces Supply

So much coal has been concentrated on the Lakes that the available commercial supply has been materially reduced in the Eastern Inland section. This shortage was apparent last week and prices firmed up. Prices for last-minute Lake shipments, however, have broken under the heavy volume of tonnage moving to the lower ports. Lake coal will move from the mines up to Nov. 20, when it is estimated that sufficient tonnage will be rolling and on hand to supply cargoes during the balance of the navigable season.

The Middle West market is flat. Warm weather has dealt the coal man a severe blow and domestic demand has been slowed. Steam coals are in heavy oversupply in this section and despite some movement, all-rail to the Northwest, the number of no-bills in Illinois and Indiana producing sections is increasing.

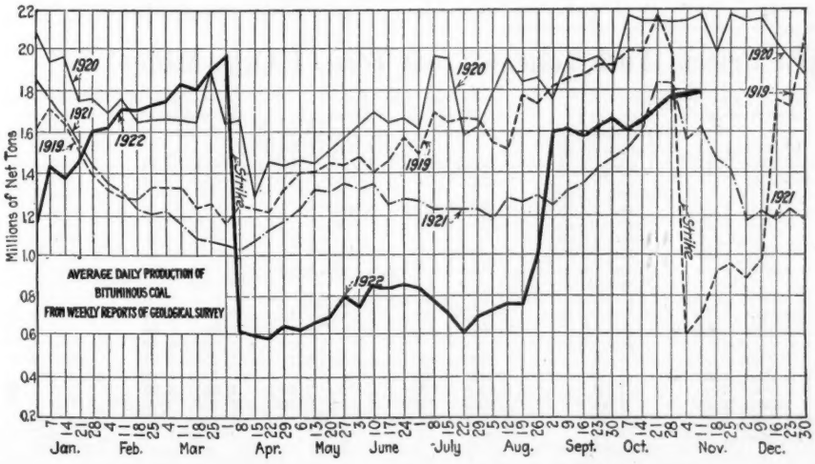
Light receipts in North Atlantic markets suffice to meet current needs. In this as in other sections further west, the close of Lake navigation is being awaited by



buyers, who feel that the release of this tonnage will soften the market considerably. A turn in the weather, however, which would also affect transportation conditions, would soon absorb this coal, and it is also quite likely that the re-entry of a large number of these dilatory buyers will have the same effect.

New England presents a featureless market. The all-rail demand is only fair and Hampton Roads is still topheavy with coal. The plenitude of supply for this section is so apparent that buyers are not interested in adding to their seasonal reserves.

The Lake season is blamed for a curtailment of domestic anthracite receipts in the Eastern section. Retail yard supplies are running down. As the shortage becomes



Estimates of Production

(Net Tons)

BITUMINOUS

	1921	1922
Oct. 21 (*b*)	11,049,000	10,378,000
Oct. 28 (*b*)	10,956,000	10,683,000
Nov. 4 (*a*)	9,327,000	10,617,000
Daily average	1,555,000	1,770,000
Calendar year	345,617,000	322,540,000
Daily av. cal. year	1,330,000	1,237,000

ANTHRACITE

Oct. 21	1,910,000	2,003,000
Oct. 28 (*a*)	1,751,000	1,804,000
Nov. 4	1,689,000	1,839,000
Calendar year	78,567,000	36,858,000

COKE

Oct. 28 (*b*)	102,000	237,000
Nov. 4 (*a*)	116,000	217,000
Calendar year	4,612,000	5,807,000

(*a*) Subject to revision. (*b*) Revised from last report.

more apparent consumers are being urged to safeguard their needs with substitute fuel, although comparatively little of this is being sold. The acute domestic demand has aided the movement of pea and buckwheat, but the smaller steam sizes are still extremely draggy.

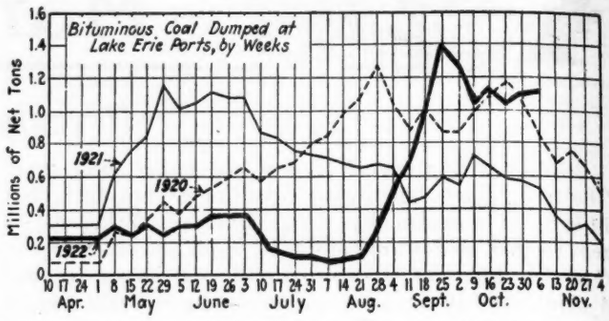
The coke market is more active, but spot prices have softened during the week. The amount of current offerings, however, is not large and coke users feel that it is not sufficient to encourage resumption of operations at plants now closed down.

BITUMINOUS

"Preliminary returns on coal loaded at the mines during the week ended Nov. 11 indicate a total production of 12,600,000 net tons, of which about 10,700,000 tons was bituminous coal and 1,900,000 tons was anthracite," says the Geological Survey. "Revised estimates for the week ended Nov. 4 show 10,617,000 tons of bituminous and 1,839,000 tons of anthracite. Thus a slight increase in the total coal raised is shown for the present week as compared with the week before.

"Loadings of soft coal on Monday, Nov. 6, as reported by the railroads, were 43,810 cars. On Tuesday, Election Day, loadings declined to 25,315 cars, but on Wednesday 33,875 cars and on Thursday 31,807 cars were loaded. The total for these first four days of the week is a little larger than for the same days of the week preceding.

"A canvass of commercial and industrial stocks of bituminous coal as of Sept. 1 and Oct. 1, undertaken co-operatively by the Bureau of the Census and the Geological



Survey, has shown that at the rate of production during the month of September consumers were able to add about 6,000,000 tons to their stocks. During October at least as much more was added to reserve piles."

Hampton Roads dumpings were 248,637 net tons during

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F. O. B. Mines

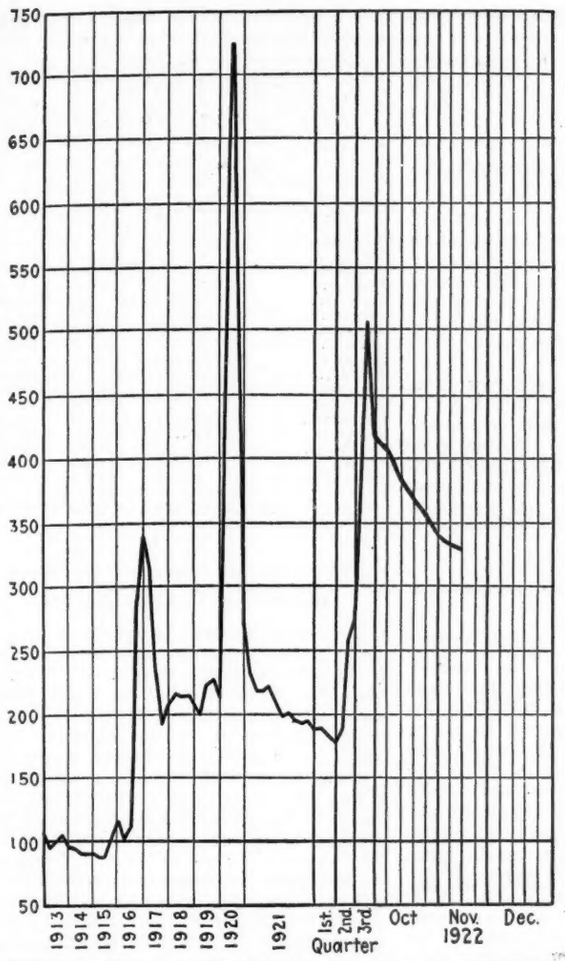
Low-Volatile, Eastern	Market Quoted	Oct. 16 1922	Oct. 30 1922	Nov. 6 1922	Nov. 13 1922†
Smokeless lump	Columbus	$6.75	$6.60	$6.75	**$6.50@$7.25**
Smokeless mine run	Columbus	6.00	6.25	6.00	**6.00@ 6.50**
Smokeless screenings	Columbus	5.50	5.85	5.50	**5.50@ 6.25**
Smokeless lump	Chicago	6.00	6.35	6.00	5.75@ 6.25
Smokeless mine run	Chicago	5.60	5.75	5.60	5.50@ 5.75
Smokeless lump	Cincinnati	6.60	7.00	7.00	*6.00*
Smokeless mine run	Cincinnati	5.95	6.10	6.10	6.00@ 6.25
Smokeless screenings	Cincinnati	5.80	6.10	6.25	6.00@ 6.50
*Smokeless mine run	Boston	7.20	7.10	6.85	**7.00@ 7.25**
Clearfield mine run	Boston	4.25	3.50	3.50	*3.00@ 3.75*
Cambria mine run	Boston	4.50	4.10	4.10	3.50@ 4.75
Somerset mine run	Boston	4.30	3.75	3.60	**3.25@ 4.25**
Pool 1 (Navy Standard)	New York	5.25	4.85	4.85	4.75@ 5.00
Pool 1 (Navy Standard)	Baltimore	5.40	.....	4.50	4.25@ 4.75
Pool 9 (Super. Low Vol.)	New York	4.65	4.25	4.10	**4.15@ 4.30**
Pool 9 (Super. Low Vol.)	Philadelphia	4.35	4.30	4.30	4.00@ 4.65
Pool 9 (Super. Low Vol.)	Baltimore	4.60	4.00	4.00	**4.00@ 4.25**
Pool 10 (H.Gr.Low Vol.)	New York	4.10	3.50	3.50	3.25@ 3.75
Pool 10 (H.Gr.Low Vol.)	Philadelphia	3.60	3.50	3.50	3.30@ 3.70
Pool 10 (H.Gr.Low Vol.)	Baltimore	4.35	3.35	3.60	*3.25@ 3.50*
Pool 11 (Low Vol.)	New York	3.50	3.05	3.00	2.75@ 3.25
Pool 11 (Low Vol.)	Philadelphia	3.25	3.15	3.15	2.90@ 3.40
Pool 11 (Low Vol.)	Baltimore	4.10	3.25	3.15	*3.00@ 3.15*
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	3.85	3.30	3.35	**3.35@ 3.60**
Pool 54-64 (Gas and St.)	Philadelphia	3.75	3.50	3.50	3.25@ 3.75
Pool 54-64 (Gas and St.)	Baltimore	4.05	3.35	3.35	*3.25@ 3.40*
Pittsburgh sc'd	Pittsburgh	5.25	5.00	4.50	4.50
Pittsburgh mine run (St.)	Pittsburgh	3.60	3.25	3.35	3.25@ 3.50
Pittsburgh slack (Gas)	Pittsburgh	3.85	3.60	3.60	3.50@ 3.75
Kanawha lump	Columbus	6.25	6.25	6.25	*5.50@ 6.25*
Kanawha mine run	Columbus	4.50	4.75	4.50	*4.00@ 4.50*
Kanawha screenings	Columbus	3.60	4.10	4.10	*3.50@ 3.75*
W. Va. lump	Cincinnati	6.25	6.00	6.00	**6.00@ 6.25**
W. Va. Gas mine run	Cincinnati	4.60	4.35	4.35	*4.00@ 4.50*
W. Va. Steam mine run	Cincinnati	3.75	4.10	4.00	*3.50@ 4.00*
W. Va. screenings	Cincinnati	4.00	4.00	4.00	*3.50@ 4.00*
Hocking lump	Columbus	5.45	4.50	5.50	5.25@ 5.75
Hocking mine run	Columbus	3.50	3.60	3.60	*3.25@ 3.75*
Hocking screenings	Columbus	3.25	3.10	3.05	*2.75@ 3.25*
Pitts. No. 8 lump	Cleveland	3.81	3.81	3.81	3.81
Pitts. No. 8 mine run	Cleveland	3.56	3.56	3.56	3.56
Pitts. No. 8 screenings	Cleveland	3.31	3.31	3.31	3.31
Midwest					
Franklin, Ill. lump	Chicago	5.35	5.35	5.35	5.25@ 5.50
Franklin, Ill. mine run	Chicago	4.50	4.10	4.10	4.00@ 4.25
Franklin, Ill. screenings	Chicago	3.25	2.60	2.60	2.25@ 3.00
Central, Ill. lump	Chicago	5.10	5.00	4.70	4.50@ 4.90
Central, Ill mine run	Chicago	3.60	3.10	3.10	3.00@ 3.25
Central, Ill. screenings	Chicago	2.35	1.85	1.85	1.75@ 2.00
Ind. 4th Vein lump	Chicago	5.10	5.10	5.10	5.00@ 5.25
Ind. 4th Vein mine run	Chicago	4.60	3.85	3.85	3.75@ 4.00
Ind. 4th Vein screenings	Chicago	3.25	2.35	2.35	*1.90@ 2.25*
Ind. 5th Vein lump	Chicago	5.10	4.75	4.75	4.50@ 5.00
Ind. 5th Vein mine run	Chicago	3.75	3.65	3.60	3.50@ 3.75
Ind. 5th Vein screenings	Chicago	2.85	2.10	2.10	*1.75@ 2.00*
Standard lump	St. Louis	4.25	4.25	4.00	**4.00@ 4.50**
Standard mine run	St. Louis	3.35	2.60	2.60	*2.50*
Standard screenings	St. Louis	2.10	2.00	1.40	*1.25@ 1.40*
West Ky. lump	Louisville	5.05	5.00	4.85	*4.50@ 5.00*
West Ky. mine run	Louisville	3.00	2.80	2.50	**2.35@ 2.75**
West Ky. screenings	Louisville	2.85	2.00	1.85	*1.50@ 2.00*
West Ky. lump	Chicago	4.10	4.10	4.10	4.00@ 4.25
West Ky. mine run	Chicago	3.50	3.10	3.10	2.75@ 3.50
South and Southwest					
Big Seam lump	Birmingham	3.25	3.95	3.95	3.45@ 4.45
Big Seam mine run	Birmingham	2.75	2.60	2.35	2.25@ 2.50
Big Seam (washed)	Birmingham	3.25	2.75	2.60	2.50@ 2.75
S. E. Ky. lump	Chicago	6.25	5.50	5.50	5.00@ 6.00
S. E. Ky. mine run	Chicago	4.75	4.25	4.25	4.00@ 4.50
S. E. Ky. lump	Louisville	6.75	6.75	6.75	*6.00@ 7.25*
S. E. Ky. mine run	Louisville	4.35	4.00	4.25	4.00@ 4.50
S. E. Ky. screenings	Louisville	4.10	4.10	4.25	*3.75@ 4.25*
S. E. Ky. lump	Cincinnati	6.75	5.85	6.25	6.00@ 6.50
S. E. Ky. mine run	Cincinnati	4.10	4.25	4.00	*3.50@ 4.25*
S. E. Ky. screenings	Cincinnati	4.00	4.00	3.85	*3.25@ 4.00*
Kansas lump	Kansas City	5.75	5.75	5.75	5.50@ 6.00
Kansas mine run	Kansas City	4.25	3.75	3.75	3.50@ 4.00
Kansas screenings	Kansas City	2.50	2.50	2.50	2.50

* Gross tons, f.o.b. vessel, Hampton Roads.
† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Latest Pre-Strike Independent	Latest Pre-Strike Company	Nov. 6, 1922 Independent	Nov. 6, 1922 Company	Nov. 13, 1922† Independent	Nov. 13, 1922† Company
Broken	New York	$2.34	.....	$7.60@$7.75	$9.00	$7.75@$8.15	$9.00	$7.75@$8.15
Broken	Philadelphia	2.39	$7.00@$7.50	7.75@ 7.85	.....	7.90@ 8.10	.....	7.90@ 8.10
Egg	New York	2.34	7.60@ 7.75	7.60@ 7.75	9.25@10.50	7.75@ 8.35	9.25@10.50	7.75@ 8.35
Egg	Philadelphia	2.39	7.25@ 7.75	7.75	9.25@ 9.75	8.10@ 8.35	9.25@ 9.75	8.10@ 8.35
Egg	Chicago*	5.09	7.50	6.90@ 7.40	.....	.....	12.50@13.00	6.92@ 8.25
Stove	New York	2.34	7.90@ 8.20	7.90@ 8.10	9.25@10.50	8.00@ 8.35	9.25@10.50	8.00@ 8.35
Stove	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.25	9.25@ 9.75	8.15@ 8.35	9.25@ 9.75	8.15@ 8.35
Stove	Chicago*	5.09	7.75	7.20@ 7.60	.....	.....	12.50@13.00	7.14@ 8.25
Chestnut	New York	2.34	7.90@ 8.20	7.90@ 8.10	9.25@10.50	8.00@ 8.35	9.25@10.50	8.00@ 8.35
Chestnut	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.25	9.25@ 9.75	8.15@ 8.35	9.25@ 9.75	8.15@ 8.35
Chestnut	Chicago*	5.09	7.75	7.20@ 7.60	.....	.....	12.50@13.00	7.14@ 8.25
Range	New York	2.34	.....	.....	.....	8.15	.....	8.15
Pea	New York	2.22	5.00@ 5.75	5.75@ 6.45	7.00@ 8.00	6.15@ 6.20	*8.20@ 8.00*	6.15@ 6.20
Pea	Philadelphia	2.14	5.50@ 6.00	6.10@ 6.25	7.00@ 7.25	6.15@ 6.20	**7.00@ 7.40**	6.15@ 6.20
Pea	Chicago*	4.79	6.00	5.60@ 6.10	.....	.....	7.00@ 8.00	5.49@ 6.03
Buckwheat No. 1	New York	2.22	2.75@ 3.50	3.50	2.25@ 4.00	4.00@ 4.25	2.25@ 4.00	4.00@ 4.25
Buckwheat No. 1	Philadelphia	2.14	2.75@ 3.25	3.50	3.25@ 4.00	4.00	3.25@ 4.00	4.00
Rice	New York	2.22	2.00@ 2.50	2.50	1.45@ 3.00	2.75@ 3.00	**1.60@ 3.00**	2.75@ 3.00
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	2.00@ 2.75	2.75@ 3.00	2.00@ 2.75	2.75@ 3.00
Barley	New York	2.22	1.50@ 1.85	1.50	0.75@ 1.75	2.00	*0.75@ 1.50*	2.00
Barley	Philadelphia	2.14	1.50@ 1.75	1.50	1.00@ 1.75	2.00	1.00@ 1.75	2.00
Birdseye	New York	2.22	.....	2.00@ 2.50	.....	2.25	.....	2.25

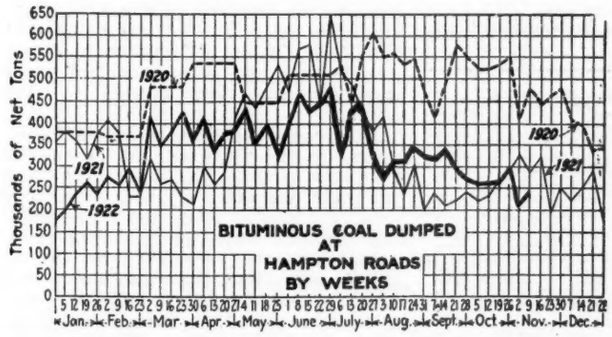
* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age, Index 340, Week of Nov. 13, 1922. Average spot price for same period, $4.12. This diagram shows the relative, not the actual prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the U. S. weighted in accordance first with respect to the proportions each of slack, prepared and run-of-mine normally shipped and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

the week ended Nov. 9, as compared with 214,874 tons in the preceding week. The coastwise market is sluggish, but so much of the Southern fuels are moving to the West that prices at the piers are firm. Receipts of British coals are dwindling.

The last-minute rush of Lake coal has reduced the estimated shortage in the Northwest. Dumping during the week ending Nov. 5, were 1,088,104 net tons as compared



with 1,026,388 tons in the week preceding. The movement for the season to date—15,577,786 tons—compares with 21,972,395 tons in 1921. Unless the winter is unusually severe Northwestern consumers of bituminous coal should be in a fairly comfortable position. Although the docks are going to be short, Illinois and other nearby mines can undoubtedly make up the deficit.

Car Loadings, Surplusages and Shortages

	Cars Loaded All Cars	Cars Loaded Coal Cars
Week ended Oct. 28, 1922	1,014,480	197,928
Previous week	1,003,759	196,771
Same week in 1921	951,384	210,630

	Surplus Cars All Cars	Surplus Cars Coal Cars	Car Shortage	Car Shortage
Oct. 30, 1922	3,716	1,584	179,239	47,273
Oct. 23, 1922	4,409	1,776	166,349	46,575
Same date in 1921	80,000	38,000	.....	.....

ANTHRACITE

Production of anthracite during the week ended Nov. 4, was 1,839,000 net tons. Preliminary returns for last week indicate an output of about 1.900,000 tons.

Demand is acute but the unseasonable temperatures have cut down the shortage, estimated earlier in the season at 40 per cent. Lake dumpings last week were 99,000 net tons as compared with 94,200 in the previous week. Steam sizes are slow with the exception of buckwheat, which is being better taken in conjunction with the domestic grades. Smaller steam coals already at New York Tidewater are in distress and some barley in loaded boats has gone for the freight charges.

COKE

Beehive coke production decreased to 217,000 net tons during the week ended Nov. 4, as compared with 237,000 tons in the week preceding. Connellsville production, however, increased 5,000 tons during the week. Demand is rather light, both from foundrys and furnaces. Those furnaces now out are actively making inquiries for lower-priced contracts in order to produce salable pig iron, but operators are holding these prices firmly.

October witnessed an output of byproduct coke larger than the monthly average for any preceding year. The total production was 2,806,000 tons, an increase of 563,000 tons, or 25 per cent over August, and of 226,000 tons, or 9 per cent, over last June, the highest preceding month of the present year. Production of beehive coke also increased and reached 878,000 tons, an increase of 74 per cent over the monthly average for 1921, but a decrease of 15 per cent compared with 1920.

MONTHLY OUTPUT OF BYPRODUCT AND BEEHIVE COKE IN THE UNITED STATES *a*
(Net Tons)

	Byproduct Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,646,000	462,000 *b*	2,108,000
September, 1922	2,244,000	606,000	2,850,000
October, 1922	2,806,000	878,000	3,684,000

(*a*) Excludes screenings and breeze. (*b*) Revised from last report.

The quantity of coal consumed in the manufacture of coke during October was approximately 5,416,000 tons, of which 4,032,000 tons were used in byproduct ovens and 1,384,000 in beehive ovens. These figures indicate that the present consumption of coal for coke manufacture is about two-thirds greater than during the period of extreme depression in 1921, and about 8 per cent less than in the active year 1920.

ESTIMATED MONTHLY CONSUMPTION OF COAL FOR MANUFACTURE OF COKE
(Net Tons)

	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	Total Coal Consumed
1917 Monthly average	2,625,000	4,354,000	6,979,000
1918 Monthly average	3,072,000	4,014,000	7,086,000
1919 Monthly average	2,988,000	2,478,000	5,466,000
1920 Monthly average	3,684,000	2,665,000	6,349,000
1921 Monthly average	2,401,000	706,000*b*	3,107,000
September, 1922	3,223,000*a*	956,000*a*	4,179,000
October, 1922	4,032,000*a*	1,384,000*a*	5,416,000

(*a*) Assuming a yield in merchantable coke of 69.6 per cent of the coal charged n byproduct ovens, and 63.4 per cent in beehive ovens. (*b*) Revised from last report.

Foreign Market And Export News

British Market Improves; Industry Reviving in France

Influx of Orders Comes with Passing of Strike Fear in Wales—Production at Peak—Meager Receipts of Coke from Germany—Acute Coal Shortage in Germany.

British market conditions are decidedly improved. The labor situation in Wales is more tranquil. This has caused an influx of orders, the strike fear now having practically passed. Prices are stronger and production is at the high mark for the year.

A slight industrial improvement in France has aided the steam coals, while domestic sorts are in strong demand. Meager and inadequate coke receipts from Germany under the Reparation Agreement are reported and French furnaces are demanding an early upward revision of the schedule.

Germany is still in the throes of an acute coal shortage. Purchases of foreign fuels are imperative but are further depressing the value of the mark.

British Secure Many Belated Orders. Output Again Breaks Record

British production has again broken the record for the year. The output during the week ended Oct. 28 was 5,388,000 gross tons, according to a cable to *Coal Age*, as compared with the high figure of 5,355,000 tons in the preceding week. Best grades are well sold up through the balance of the year. Topheavy supplies of lesser quality coals are weakening their position.

The improved labor outlook in Wales has resulted in a renewed influx of orders. Since the men have practically refused to strike over the non-unionist question the industry has become more settled. Shipments to Canada are still substantial and it is said that Canadian buyers will want Welsh coal throughout the winter. Continental buyers have been holding up orders till the labor difficulties were over, and the Welsh pits now find themselves well booked.

The north English collieries are, with few exceptions, sold out for the rest of the year. The best customers are Canada and Germany. Latest contracts are for lots varying from 25,000 to 40,000 tons for delivery monthly at 22s. f.o.b. One firm alone has contracts with Durham pits for 200,000 tons for delivery during next year at prices around 21s. Prices are firm, and several descriptions are quoted at higher figures.

BRITISH COAL INDUSTRY LOSING MONEY

Official statistics for the twelve months ended June 30, 1922, show that during that period the profits of the industry as a whole amounted to about £9,000,000, compared with £28,000,000 guaranteed by the government to the owners during the period of control and with an average pre-war net profit per annum of about £18,000,000. This profit of £9,000,000, however, is more apparent than real. As part of the settlement of the strike in 1921, £10,000,000 was granted to the mining industry, and about £6,000,000 of the £9,000,000 profit was made during July and August, 1921, when this subsidy was in effect. Furthermore, owners have had to surrender £3,000,000 of the £9,000,000 to the miners to guarantee the minimum wage under the agreement of June, 1921. Under the agreement the industry was divided into thirteen districts, and of the profits shown, £6,830,000 was made in two of these districts only—the Eastern Federated Area and the Lancashire, Cheshire, and North Staffordshire Area. The former area alone showed a profit of £5,504,586.

Rise in British Coal Exports

During September Great Britian exported 7,082,729 gross tons of coal, compared with 6,146,121 in August and 3,406,579 in September, 1921. In 1912 the average value of British coal exports was just under 13s. 8d. per ton; now it is 22s. 7d.

BRITISH EXPORTS NINE MONTHS ENDED SEPTEMBER 1913, 1921, 1922

	Gross Tons		
	1913	1921	1922
Russia	4,462,660	65,091	401,572
Sweden	4,275,151	604,820	1,680,133
Norway	1,688,549	369,426	1,153,190
Denmark	2,213,216	1,049,719	2,004,025
Germany	6,783,574	445,557	6,182,086
Netherlands	1,544,894	922,949	4,096,586
Belgium	1,546,636	174,925	2,095,931
France	9,567,410	3,248,523	9,660,182
Portugal	909,446	289,667	608,618
Spain	1,870,183	656,582	1,330,406
Italy	7,150,025	1,917,483	4,554,086
Greece	507,251	183,872	304,422
Algeria	952,241	265,514	761,684
Port. W. Africa	190,082	86,638	144,518
Chile	457,641	12,496	67,005
Brazil	1,445,749	113,450	738,108
Uruguay	568,142	134,793	380,346
Argentine	2,725,303	472,295	1,320,654
Gibraltar	254,791	242,553	477,209
Egypt	2,259,230	495,047	1,287,152
Br. India	125,832	225,169	886,733
Ceylon	174,358	86,044	175,572
Other countries	1,169,766	853,939	4,323,151
Total	54,517,788	13,351,554	45,476,573

French Market Improves; Increased Reparation Tonnage Needed

Industrial demand is satisfactory, especially as regards gas and coking sorts, and stocks are decreasing. Several collieries have decided to start their coke ovens, and this will reduce available supplies of coking slacks. The rush for domestic continues unabated.

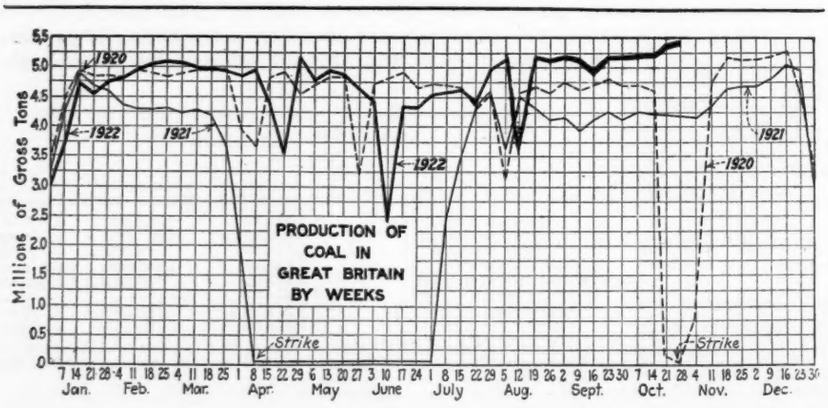
Belgian coalowners have caused a revision of outstanding contracts on the basis of the following increases: Nuts, 20 fr.; all other kinds of sized coals, 10 fr.; ovoid briquets, 18 fr. Parisian householders now pay, as from Nov. 1 270 fr. for Belgian nuts of half-fat coals; 183 fr. for French screened coal; 280 fr.@290 fr. for Belgian anthracite nuts; 370 fr.@410 fr. for Welsh anthracite nuts.

Newcastle or best Yorkshire coals are now quoted 34s. 6d. c.i.f. Rouen, which, at the present rate of exchange, is equivalent to 108 fr.@110 fr.

The output of the Lorraine and Sarre fields is increasing and a good part of it is absorbed by Germany. Loire and Center fields are aided by the present industrial improvement and stocks are decreasing.

The Commission of Reparations, which has provisionally moved to Berlin, will soon determine the future quantity of German reparation coal deliveries to the Entente. This had been fixed in August, at 1,725,000 tons per month for September and October, inclusive of 125,000 tons from Upper Silesia which Germany did not even attempt to deliver. It is probable that Germany will do her utmost to obtain a reduction and a very artful press campaign has been started to that effect.

After allowing for the present shipments to the Entente, the territories that now compose the Reich still claim for their consumption about 11,600,000 tons per month, while the corresponding figure in 1913 for the same territories was only 11,500,000 tons. As regards coke alone, the situation is still more favorable for Germany. The Entente demands now in force leave at the disposal of the present German territories a coke supply representing about 106 per cent of their pre-war requirements. At the same time, French blast-furnaces are only granted 79 per cent of the quantities of German coke de-



livered to them before the war, this proportion being still further reduced by the fact that Germany never delivers the whole of the tonnages due. French blast-furnaces, therefore, which cannot hope for a long time to obtain sufficient supplies of French coke, are forced to curtail their production, which is hardly 60 per cent of capacity.

FRENCH IMPORTS IN METRIC TONS

	September	1st 9 Months, 1922
Coal from:		
Sarre	332,861	2,625,656
Great Britain	886,327	8,622,680
Belgium	208,198	1,806,833
U. S. A.	.....	23,255
Germany	232,563	2,856,703
Netherlands	31,617	485,861
Other countries	8	3,706
Total	1,691,574	16,424,694
Coke from:		
Great Britain	2,270	40,615
Belgium	37,159	370,057
Germany	351,664	3,149,461
Other countries	29,828	161,168
Total	420,921	3,721,301
Briquets from:		
Great Britain	6,461	109,696
Belgium	63,589	592,579
Germany	46,237	343,693
Other countries	715	3,743
Total	117,002	1,048,711

FRENCH EXPORTS IN METRIC TONS

Coal to:			
Belgium		103,755	229,989
Switzerland		11,600	358,785
Spain		208,430	413,640
Italy		410	20,201
Germany		55,441	246,589
Luxemburg		10,662	110,865
Austria		405	697
Other countries		18,933	100,011
Bunkers,	French steamers	12,246	62,637
	Foreign steamers	4,090	21,059
Total		425,972	1,564,473
Coke to:			
Switzerland		15,082	56,671
Spain		323	1,183
Italy		26,951	130,591
Germany		774	7,256
Other countries		3,830	141,556
Total		46,960	337,257
Total, patent fuels		7,805	68,730

FRENCH RECEIPTS OF REPARATION COAL

	Last 10 Days of September	First 10 Days of October
Coal	107,700	120,300
Coke	183,300	179,000
Lignite Briquets	15,400	16,700

Export Clearances, Week Ended November 9, 1922

FROM HAMPTON ROADS

For Cuba: Tons
Dan S.S. Normannia, for Monati..... 2,515
Nor. S.S. Bowden, for Preston and Banes 1,032
For Ecuador:
Br. S.S. Alvarado, for Guayaquil..... 549

German Prices Raised Again

Production in the Ruhr region during the week ended Oct. 28 was 2,005,000 metric tons, according to a cable to *Coal Age*. The output for the previous week was 1,989,000 tons.

Because of the large increase in the wage scale the coal prices have again been raised. Effective Nov. 1, an advance of 2,060M.@7,115M. per ton was made on unwashed fat coal.

The output of the Ruhr basin and Left Rhine collieries in September amounted to: Coal, 8,265,688 tons (8,336,773 tons in August) or 317,911 tons (308,769 tons) per working day; coke, 2,128,328 (2,176,208 tons) or 70,944 tons (70,200 tons per working day; briquets, 413,282 tons (375,191 tons) or 15,895 tons (13,896 tons) per working day, according to the *Colliery Guardian*. Only 52 per cent of the miners worked the overtime shifts in the latter half of the month, but the percentage has since increased to 77.5 per cent.

The Rhenish lignite district produced 3,234,961 tons of coal and 646,551 tons of briquets; and the Mid-German lignite mines, 8,074,105 tons of coal and 1,852,890 tons of briquets.

September Exports, by Customs Districts

Customs Districts	Gross Tons: Anthracite	Bituminous	Coke
Vermont	288	444	750
St. Lawrence	29,148	17,918	1,471
Rochester	14,737	43,586	23
Buffalo	41,948	233,036	10,743
New York	10	687	106
San Antonio	38	43	.....
El Paso	63	2,295	735
San Diego	6	10	.....
Arizona	1,151	2,358	3,951
Washington	1	674	.....
Alaska	2	.....	.....
Dakota	907	749	1,406
Duluth & Superior	135	660	.....
Michigan	254	140,993	13,593
Philadelphia	.....	3,550	.....
Virginia	.....	48,836	1,864
South Carolina	.....	4,151	.....
Mobile	.....	3,410	.....
New Orleans	.....	251	584
Ohio	.....	671,356	73
Maine & N. H.	.....	.....	173
Total	88,688	1,175,007	35,472

United States September Coal Exports

	Gross Tons: Sept., 1921	Sept., 1922
Bituminous coal:		
By rail to:		
Canada	1,034,816	1,110,794
Mexico	13,688	4,756
Total	1,048,504	1,115,550
By vessel to:		
British West Indies	6,305	5,113
Other West Indies	3,653	1
Cuba	31,748	31,709
Panama	9,606	19,163
Total	51,312	55,986
France	17,045	.....
Italy	17,898	.....
Total Europe	34,943	.....
Argentina	33,659	.....
Brazil	24,411	.....
Chile	1,455	.....
Total South America	59,525	.....
Egypt	5,916	.....
Other countries	11,410	3,471
Total bituminous exports	1,211,610	1,175,007
Total anthracite exports	285,468	88,688
Total coke exports	17,634	35,472

Coal Paragraphs from Foreign Lands

ITALY—The price of Cardiff steam first is now quoted at 40s. 3d. on the Genoa market, according to a cable to *Coal Age*.

A Milan note hints at a rise in coal prices, and advises consumers not to expect a reduction except such as may take place for a moment in consequence of a passing glut. This, on the other hand, may be easily absorbed by ready buyers.

Extensive development of power by utilization of the lignite deposits of Italy is being considered under the Government subsidy plan for making use of the national fuel resources, according to a report to the Department of Commerce by Consul Russell, Rome.

BELGIUM — The arrival of cold weather has still further increased the demand for domestic descriptions. Prices are firm and delivery periods are lengthening.

During September 1,751,210 tons of coal were extracted from Belgian mines as against 1,694,940 tons in August. On Sept. 30 stocks of coal stood at 758,070 tons, a reduction of 283,810 tons. Production of coke amounted to 239,260 tons compared with 245,040 tons in August and the production of briquets was 203,490 tons, as against 216,610 in August.

CANADIAN COAL IMPORTS for the first nine months of 1922 were 1,245,943 tons of anthracite and 5,417,975 tons of soft coal, as compared with 3,642,189 tons of the former and 9,896,760 tons of the latter during the 3-year average, 1919, 1920 and 1921, for the same period.

Featureless Market at the Roads

Continued dullness was apparent last week, with depletion in the coal supply. Shipments from the mines continued below normal, with supplies so scattered in the trade that no shipper had a normal quantity on hand.

Coastwise movement was still reduced, because of shipments to the West and Northwest. The trade was anticipating a decrease in this movement in the next two weeks, with a consequent revival of business here.

Hampton Roads Pier Situation

	Week Ended: Nov. 2	Nov. 9
N. & W. Piers, Lamberts Pt.:		
Cars on hand	571	611
Tons on hand	32,993	36,024
Tons dumped	66,117	72,425
Tonnage waiting	28,950	11,100
Virginian Ry. Piers, Sewalls Pt.:		
Cars on hand	723	829
Tons on hand	43,250	48,750
Tons dumped	84,748	90,261
Tonnage waiting	26,443	11,917
C. & O. Piers, Newport News:		
Cars on hand	422	508
Tons on hand	21,100	25,400
Tons dumped	40,887	59,312
Tonnage waiting	1,470	.....

Pier and Bunker Prices, Gross Tons

	Nov. 4	Nov. 11†
PIERS		
Pool 9, New York	$7.50@$7.75	$7.50@$7.75
Pool 10, New York	6.75@ 7.00	7.00@ 7.50
Pool 11, New York	6.50@ 6.75	6.50@ 6.75
Pool 10, Philadelphia	7.15@ 7.65	7.15@ 7.65
Pool 11, Philadelphia	6.90@ 7.35	6.90@ 7.35
Pool 1, Hamp. Roads	7.00@ 7.15	7.40
Pools 5-6-7 Hamp. Rds.	7.00	7.40
Pool 2, Hamp. Rds.	7.00@ 7.15	7.40
BUNKERS		
Pool 9, New York	$7.90@$8.15	$7.90@$8.15
Pool 10, New York	7.15@ 7.40	7.40@ 7.75
Pool 11, New York	6.85@ 7.10	6.90@ 7.15
Pool 10, Philadelphia	7.65@ 8.15	7.65@ 8.15
Pool 11, Philadelphia	7.40@ 7.90	7.40@ 7.90
Pool 1, Hamp. Rds.	7.15	7.50
Pool 2, Hamp. Rds.	7.15	7.50
Welsh, Gibraltar	38s. f.o.b.	38s. f.o.b.
Welsh, Rio de Janeiro	57s. 6d. f.o.b.	57s. 6d. f.o.b.
Welsh, Lisbon	37s. f.o.b.	37s. f.o.b.
Welsh, La Plata	50s. f.o.b.	50s. f.o.b.
Welsh, Genoa	41s. t.i.b.	41s. t.i.b.
Welsh, Algiers	38s. f.o.b.	38s. f.o.b.
Welsh, Permambuco	65s. f.o.b.	65s. f.o.b.
Welsh, Bahia	64s. f.o.b.	64s. f.o.b.
Welsh, Madeira	42s. 6d. f.a.s.	42s. 6d. f.a.s.
Welsh, Teneriffe	38s. 6d. f.a.s.	38s. 6d. f.a.s.
Welsh, Malta	41s. f.o.b.	41s. f.o.b.
Welsh, Las Palmas	38s. 6d. f.a.s.	38s. 6d. f.a.s.
Welsh, Naples	41s. f.o.b.	41s. f.o.b.
Welsh, Rosario	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, Singapore	52s. 6d. t.i.b.	52s. 6d. t.i.b.
Welsh, Constantinople	52s. 6d. f.o.b.	52s. 6d. f.o.b.
Welsh, St. Michaels	50s. t.i.b.	50s. t.i.b.
Welsh, Port Said	49s. f.o.b.	49s. f.o.b.
Welsh, Oran	38s. f.o.b.	38s. f.o.b.
Welsh, Fayal	50s. t.i.b.	50s. t.i.b.
Welsh, Dakar	42s. 6d. f.o.b.	42s. 6d. f.o.b.
Welsh, St. Vincent	42s. f.a.s.	42s. f.a.s.
Welsh, Montevideo	50s. f.o.b.	50s. f.o.b.

Current Quotations British Coal f.o.b. Port, Gross Tons

Foreign Quotations by Cable to Coal Age

Cardiff:	Nov. 4	Nov. 11†
Admiralty, large	28s.@ 29s.	28s. @ 28s.6d.
Steam, smalls	16s. @ 17s.	16s. @ 17s.
Newcastle:		
Best steams	27s.	52s. 3d. @ 27s
Best gas	24s. @ 25s.	24s. @ 25s.
Best bunkers	23s.6d.	23s. @ 24s.

North Atlantic

Trading Suffers Doldrums; Inquiries Are Plentiful

Current Demand Satisfied by Light Receipts—Early Improvement Foreshadowed—Stiff Undertone on Scarce Good Grades—Transportation Gradually Improving—Southern and British Receipts Dwindle.

Trading is still slow although there are plenty of inquiries. The light receipts are sufficient to meet current demand but there are many indications of an early betterment. Prices show little change, but good grades are so scarce that a stiffening tendency is evident.

As in other markets buyers are defending their dilatory attitude by the statement that they expect freer offerings after the close of Lake navigation.

Transportation conditions are improving slowly. Railroads are more active in the market and considerable complaint is heard from operators who are attempting to run on straight commercial business that preferential supply for carriers' needs leaves them but little loading equipment. Receipts of Southern coal are dwindling, while British cargoes are now arriving only occasionally.

PHILADELPHIA

There is no appreciable change in the situation. The light amount of coal coming upon the spot market seems to be entirely sufficient for the demand. It might be said that inquiries for small shipments are inclined toward betterment, as the moderate users show an inclination to put by a little more coal.

There is no lessening of the complaint of car shortage by the producers, some claiming that it has grown worse. One firm in advising their trade as to conditions said their mines had been closed for the eighth successive day, stating "if we can prove favoritism against the railroad in distributing cars we intend to enter suit, as we cannot exist under present conditions."

A large share of production is still going to the railroads for supply fuel, some of the lines in the Northeast recently entering the market strongly.

At Tide there is very little activity, outside of bunkering and this is somewhat light. No foreign coal is coming in, although there has been a stray cargo of Southern coal. It is of interest, though, to note the recording of a charter for a cargo of British coal, delivery to be made sometime in November.

Price changes have been few and are at the same level as a week ago. It must be noted, however, that coals of Pools 1 and 9 grade are somewhat scarcer, with an occasional light price advance, and the whole market seems to have grown steadier.

CENTRAL PENNSYLVANIA

Production for October totaled 82,714 cars as compared with 74,039 cars for September. The maximum daily production for the present year was reached on Oct. 30, when 4,023 cars were loaded. On the following day it dropped to 3,104 cars and on Nov. 1, it dropped to 2,383. The drop was due to the car shortage, although some little improvement is noted.

Since the fatal disaster at Spangler on Nov. 6, production fell off, particularly in Cambria County, due to the miners helping in the rescue work at the Reilly mine and the concentration of fire and mine foremen at that point.

FAIRMONT

Car shortage is still interfering with production. The car supply on the Western Maryland is somewhat better than on the B. & O. Lake shipments have been appreciably increased. Prices for Eastern delivery are not on quite so high a level.

NEW YORK

If producers booked one-half the orders represented by the inquiries received the mines would not be able to produce the coal needed to meet the demand. This was the opinion of some local houses, while others contended there was little doing. The number of cars at the local docks were about the same as last week.

Buyers are apparently on strike. It is believed they are waiting for the close of Lake navigation. With this source of consumption cut off they believe larger shipments will come to this market, increasing supplies and probably lowering prices.

An embargo was reported as having been placed on Monongahela coals coming east. This action was taken in order to force the shipments of these coals westward.

The car shortage is becoming more acute. None of the roads can boast of more than 50 per cent normal supply while most of them are running from 10 to 20 per cent below.

Line demand is stronger than Tidewater. Considerable Pennsylvania coal is going into New England with the result that the Southern coals are losing some of the market obtained during the strike.

British coal arrives in small quantities now. There is some in the harbor but buyers do not appear to take kindly to it. Welsh anthracite is being offered to consumers at around $15. Southern coals are not active here. Quotations were around $9 toward the end of the week.

UPPER POTOMAC

The advent of November found mines producing more coal on an average than during the year 1921. It is true that there is not a large tonnage being mined in some parts of the Georges Creek region but on the Cumberland Division of the B. & O. the output is increasing and in the Upper Potomac field it is larger than at any time in recent months. Market conditions are largely unchanged. The best demand was from the West.

BALTIMORE

The fact that Federal Fuel Distributor Spens announced from Washington that there was now approximately 35,000,000 tons of soft coal in storage has had a tendency to make fuel burners in Baltimore feel firm in their position of refusing to buy largely for storage. While Baltimore industries have been buying lightly and a review of the storage situation shows that there is not more than about a 40-day supply ahead, the situation as to demand and run of coal to this point is such as to leave a market without exciting features.

While most of the best grades of steam are under contract, there are some on the market and the offerings of intermediate and lower grade coals have been so free as to throw the trading into active competition. A renewed activity is noted on the coastwise movement. For the first ten days of November four steamers cleared with coal, two of the New England Fuel & Transportation Co. for Boston; one of the Munson Steamship Line for Portland, Me., and one for Searsport, Me. No further importation of English coal is noted, nor was there any shipment of American coal on export.

South

BIRMINGHAM

The cry for domestic coal continues to feature the trade here, with little or no improvement in supply. A survey of local yards recently revealed a total of approximately 15,000 tons on hand, which would last scarcely ten days in the event of a cool spell. The slack supply of domestic is due to two causes —shortage of cars and lack of demand for steam coal in such volume as should exist at this season of the year.

The commercial market is without change. Demand is comparatively light and there is some surplus of the low-grade coals. Commercial mines are operating from one-third to half time. Quotations have undergone no change in the past week.

Car supply is scarcely better than 50 per cent in the field, but the railroad shops are making better headway in repairing equipment and restoring it to service. The situation is expected to improve gradually.

VIRGINIA

Production has undergone a slight decrease, due largely to the loading slump on the Southern and the Interstate, offset in part by increased production on the N. & W. and the C. C. & O. Losses are due entirely to a shortage of cars and other transportation difficulties. Despite lack of briskness in the market, the entire output is being readily absorbed, though prices are low, the range on mine run being $3.50@$4.50, depending upon the market in which coal is sold.

Anthracite

Householder Loath to Order Anything but Anthracite

Substitutes Urged as Shortage Becomes More Evident—Pea and Buckwheat Moving More Freely — Producers Aided by Mild Weather in Effort to Satisfy Needs of Northwest.

Substitutes are being urged on consumers as the shortage becomes more apparent, but householders are still loath to buy anything but anthracite. The strong demand, however, is enhancing pea and buckwheat is also moving more freely. Producers are making every effort to supply the Northwest before Lake navigation ceases, which may account for diminishing receipts in the East. In this they are abetted by the mild weather, which has cut down the season's shortage, estimated earlier in the year at 40 per cent. Lake dumpings at Buffalo were 99,000 tons last week, as compared with 94,200 tons in the preceding week.

The smaller steam sizes are still a drug on the market. Steam coals are in distress at New York Tidewater and some barley in loaded boats has gone for the freight charges.

PHILADELPHIA

The week has been almost completely barren of shipments. Outside of fair independent receipts it can be taken almost literally that the companies have shipped no coal at all. The yard with coal is the exception now, even those large yards which have rarely ever been without stocks.

The public is surely favored by the weather, and it is just possible that the big producers are watching this phase, being ready to divert coal here the moment that normal November weather may arrive. The report is strongly current that the heavy shipments to the Northwest are being made by direction of the Federal Fuel Administration.

The dealers here argue if conditions are so severe there. they should use bituminous coal, which can be supplied to that district much easier than anthracite.

The best news the retailers have is a promise that a break in the shortage of coal here is to come soon. A few already advise they now have the first reports of shipments for weeks. The tip has been passed that by Nov. 20 coal will begin to roll along in better volume. So far the public is fairly calm over the situation, as very little fuel is needed, but despite this the retailers report that they are continually urged to make deliveries as soon as possible.

Steam coals are still lagging behind, with a bit more improvement in buckwheat. Much of this improvement though is being made at the urging of producers who insist that some buckwheat must go with family sizes.

BALTIMORE

Anthracite dealers are having a most difficult time in attempting to meet even the most urgent demands of customers. It is estimated that, despite recent arrivals at the rate of more than 2,000 tons of hard coal daily, that there are still more than 40,000 homes not supplied with coal, of which probably 25,000 at least would have had a large part of their winter supply in by this time. There are also a large number of consumers using up to one- and two-ton deliveries which were made to them on account. Many dealers have not gotten around their customers even with the one- and two-ton deliveries. Fortunately the weather has been mild so far, but consumption has been heavy enough to cause quite a few consumers to start a call for additional fuel.

BUFFALO

The demand of course greatly exceeds the supply, but the weather has been so mild that nobody is very urgent, especially as the supply of natural gas keeps up well. Quite a good many have bought coke, soft coal or small sizes of anthracite and there certainly will be no distress right away, if at all.

Complaint is made that Buffalo has not received as much coal as was allotted to it. Still the shippers are predicting that there will be little or no difficulty. The independent operators are turning out only a small amount of coal, as they find it hard to get cars. They are still asking $12.50@$13 for it at the mines.

Lake shipments are not up to the average of former seasons, being for last week 99,000 tons, of which 41,200 tons cleared for Duluth and Superior, 9,200 tons for Ashland, 7,800 tons for Hancock, 25,500 tons for Milwaukee, 9,300 tons for Sheboygan, and 8,000 tons for Chicago. Rates are unchanged.

NEW YORK

Pressure is being used to induce users of the domestic sizes to revert to substitutes. So far these efforts have not been entirely successful but greater success is looked for as the winter advances.

The one thing that has prevented a serious situation has been the mild temperatures. Those consumers who have not yet obtained any coal are becoming alarmed lest they will have to be without furnace heat for some time to come. Retail dealers' books contain many orders which have not been filled, although the orders were entered some time ago.

Because of the scarcity of the larger sizes dealers are able to move more pea coal, and this is moving well for this market.

The steam sizes continue to move slowly. Buckwheat is the exception. This size is being taken by some dealers when they obtain the larger coals at the mine. Greater difficulty is experienced, however, when efforts are made to move the coal already at Tidewater and it was reported that some loaded cargoes had been offered as low as $5, alongside.

There is practically no call for rice and in many instances buyers have been able to name their own price. Barley is dormant. It was said that some of this size had been sold in loaded boats for the freight charges.

BOSTON

Shipments are coming along with exasperating slowness. By water there is delay in loading, and all-rail there is shortage of cars and locomotives. The producing companies, who are making a big effort to get coal to the Lakes before the close of navigation, are curtailing their shipments to New England and other sections. As a result, there is a lot of apprehension lest really cold weather overtake the volume of coal normally due this territory.

At retail there is constant pressure on the part of householders. The largest Boston distributor has at last advanced its retail price to $16, the mark set by most of the other dealers a fortnight ago.

West

SALT LAKE CITY

The car situation in Utah is still a troublesome problem. The carriers appear helpless to effect any noticeable increase in the slim supply of cars delivered to mines.

The recent cold snap continues, setting up in Salt Lake City exactly the condition which is expected to arise in every other market with the first real cold. The supply is low, people are beginning to scramble for fuel, and the tendency toward higher prices is difficult to restrain. However, the recent indictments of coal men is having a good moral effect on some of the less responsible ones. There is considerable worry in certain quarters over the danger of some people suffering soon for want of fuel.

Canada

TORONTO

Supplies of anthracite coming forward are not sufficient to fill all orders for ton lots and dealers are obliged to refuse further orders until those in arrears are filled. The standard price of $15.50 per ton is maintained by the larger dealers, but some of the others who are unable to secure immediate delivery from the mines and obtain supplies through brokers, ask as high as $18. Little change is expected until navigation closes and some of the coal now going west by water is diverted to Ontario points.

Conditions as regards bituminous show little change. Supplies being rather more plentiful, but prices variable, ¾-in. lump in carload lots selling for $8.75 and upward, and Pennsylvania smokeless about $9.

Chicago and Midwest

Dull Trading Shows Few Signs of Improvement Yet

Fields All Thankful for Short Supply of Cars—Lump Prices Fairly Firm but Steam Sizes All Drag Bottom—"Oh for Winter!" Sighs Trade.

Demand in practically everything continues light with only one real prospect of relief—imminent winter. A thin trickle of steam demand which is keeping itself out of public sight is the only change worthy of mention since last week. This is so trivial as not to have lifted screenings out of the price dumps, but it indicates some buying must be done soon. Markets generally remain so lifeless that the producing fields can not but be thankful that car supply continues weak.

At St. Louis, market conditions remain as low as last week, with not a single sign of relief. Kentucky fields are glad they are averaging but 18 to 20 per cent car supply and are wondering whether they will lose even more of their market when the Lake shipping season closes. In all fields, business is largely on a day-to-day basis and price concessions on everything are made frequently.

ST. LOUIS

Continued warm weather has about ruined the local market. Domestic buying has practically stopped and steam users are playing the market for further reduction. Such coal as is moving to the dealers is being stored. There is nothing being stored in the way of steam locally, except by the Union Electric and Laclede Gas companies. The country demand for steam has suddenly dropped off on account of warm weather and the effort made by shippers to move a little has reduced prices. This has become a continuous performance.

Country domestic has eased up and very little is moving. The entire Midwest hopes for and expects a reduction in price, while operators are steadfast in their refusal to make any concession. The Terminal congestion in St. Louis is bad on west bound lines but it is being cleared up gradually.

A little smokeless is moving through and some anthracite. Nothing comes in from the Arkansas district.

LOUISVILLE

Due to the fact that eastern Kentucky is not averaging much better than 18 per cent car supply production is so limited that considering movement to the Lakes, tonnage on open market is so small that the operators are able to maintain prices in spite of the fact that West Virginia is quoting lower figures. However, if the Lake movement does not last much after Nov. 15, it is believed that prices will break somewhat, especially as cessation of Lake shipping will perhaps result in more short hauls and better car supply.

Right now there is reported fair movement to Ohio points, to Detroit, and to the railroads, while Southern business to the textile districts has not been so keen.

It is claimed by operators and jobbers that some of the market quotations on southeastern Kentucky are being confused with non-gas coal, and that sizes are not being properly differentiated. Some of the mines are producing a 2-in lump which is selling for $6@$6.50, while they are asking $6.50@$7.25 for 4-in. block coal. Harlan gas is generally quoted at $4.25@$4.50 for mine run, whereas non-gas coal is $4@$4.25 and some is reported at $3.75. Screenings are generally selling at about the mine run price, although some quotations have been reported as low as $3.50. While talk is being heard of $3.75 mine run, jobbers say that they cannot get coal in sufficient quantities to supply open orders at $4.

SOUTHERN ILLINOIS

Warm weather and an indifferent public that still continues to expect a lower price have almost stopped the demand for high-grade coal. Lump and egg continues to move, but is not in any great demand. Nut is heavy and screenings are a serious problem. The day, however, has been saved by the car shortage. The railroad tonnage is below normal, principally on account of movement and no empties.

There is no market for Duquoin and Jackson county coal. Even the screened sizes in some of these districts have to be forced. The Mt. Olive field has carried no-bills of lump, egg, nut and screenings for several days and Saturday night saw about 150 no-bills on the Wabash alone. Part of the trouble in this territory is the hopper bottom cars which dealers are refusing to accept. Both steam and domestic are topheavy, although the prices on the domestic sizes have been maintained, but screenings are breaking, as well as steam nut.

In the Standard field mines get from one to three days a week. The L. & N. has perhaps the poorest supply of cars. This week the Wabash had a surplus one day on account of every mine on its rail having no-bills and this surplus was diverted to the L. & N. for loading. The market for this field has gone to pieces. Screenings are still $1.25, 2-in. lump, $3, 6-in. lump, $4, and steam, nut and egg, $2.25 and up.

CHICAGO

Trade seems ready to show an upward trend at any moment with the arrival of a colder wave, but throughout the week business remained sluggish, with wavering of prices which were already weak. The determination of southern Illinois and Indiana producers to prevent any general decline on lump continues uniformly successful. The $5.50 level rules the market on very best coal. There are concessions here and there but not enough to start a general cave-in. Screenings remain an absolute drug in all fields. Many no-bills of this size are held overnight in almost all fields, it is reported.

Trading remains light in all coals. The demand for anthracite is considerable but not ravenous because winter has not arrived and because many a consumer apparently has decided he is going to burn soft coal and will buy in a little when the price drops. Cold will attend to prices.

Only one report in the market is encouraging. The news is circulating steadily that a number of the bigger buyers are at last beginning to take just a little more coal than they use from day to day. The increase in volume is small and purchases are covered up as neatly as possible. This movement by no means takes care of the volume of steam coal available but it counts for something.

WESTERN KENTUCKY

Operators selling their production on a day-to-day basis have been forced at times to release unsold coal in the late afternoon at slightly under the market, with the result that some of this cheaper spot stuff, which is twin brother to distress coal, is being confused in quotations as the regular market.

Some of the jobbers who have had some open orders at $2.50 a ton. have had trouble in locating much coal that could be sold at that price for mine run, and still allow them a commission, although there has been some talk of $2.25 mine run, and perhaps some low-grade stuff has sold that low, other than loaded coal that the operator had to dispose of. However, really first-class mine run is fairly firm at $2.50@$2.75 in quantities, as production can't be very active when car supply for the first several days of November has been but 25 per cent on the L. & N. and 30 per cent on the I. C.

The field in which western Kentucky coal is moving, has been materially reduced since mines north of the Ohio got back into operation. Movement by river has been very small also, due to continued low water in the Ohio.

Screenings have been weak in spite of comparatively small production, ranging $1.50@$2 for both pea and slack and nut and slack, while the pea and slack may be shaded by 10c. a ton. Lump is generally quoted at $4.75, with very little coal at under $4.75.

INDIANAPOLIS

Sunshine and balmy weather is a combination which promises to break prices on domestic coal. Steam prices have already softened, due to lack of demand.

The situation is without parallel in Hoosier mine operation. For five months the strike shut off much of the coal supply. Weeks have gone by since and yet there is no demand. Approximately half the mines are closed each day, either because of lack of cars or lack of demand.

Eastern Inland

Filling of Current Needs Leaves No Surplus Coal

Movement to Lakes Reduces Available Spot Commercial Fuel—Curtailed Supply and Increasing Needs Have Bracing Effect—Domestic Mine Price Up 50c. in Ohio.

Current needs are being met easily but there is no surplus left. Concentration of tonnage to the Lakes leaves little spot commercial coal available. The lack of abundant supply has firmed spot prices while the growing needs of consumers have had a strengthening tendency. Shipments to the Lakes probably will cease on Nov. 20, when, it is estimated, sufficient tonnage will be rolling to supply cargoes during the balance of the season.

The Ohio fuel authorities have raised domestic mine prices 50c. to safeguard home needs and prevent so much of this tonnage going to outside markets where prices are higher.

PITTSBURGH

Car supplies show no material change, running generally at about 40 per cent of rated mine capacity. Operators are maintaining contract shipments without much difficulty and have sold free coal for the open market, not enough to cause a decline in prices even though the demand is not particularly heavy.

The steel industry seems to be able to maintain its supplies of coal for gas, power and byproduct coking without much difficulty, and even to accumulate a little reserve. Steel production in October was at the highest rate since October, 1920. Demand for domestic coal is fair but not excessive.

Prices are a shade stiffer, although there is no important change in the quotable market. Fair grades of steam are $3.25@$3.50, ordinary byproduct, $3.75@$4.00, while high grade byproduct, may command up to $4.25. Youghiogheny gas is $4.50 for mine run, screened being $5@$5.50. Domestic 1¼-in. is $4.50, in accordance with the recent arrangement between the fuel administration and operators of the district.

CLEVELAND

The supply in this city is making no appreciable gains despite the recent agreement between the fuel administration and Ohio coal operators, who were to get more cars in return for consigning more coal to points within the state. At the present time the bituminous coal trade is concentrating upon shipments to lower ports.

The Lake movement has outrun expectations. It is now thought that fully 17,500,000 tons will be shipped. This will be about 5,000,000 tons short of the normal movement. It will be sufficient to supply current needs, however, but will not permit of a large carry-over next spring. Under an order from the I. C. C. all mines shipping to the Lake are guaranteed a 50 per cent car supply. A 48-hour priority also put all open-top cars into coal service for delivery of coal to the ports.

Partly as a result of the lack of abundant supply and partly because of growing needs of consumers, the Cleveland coal market continues steady. There has been no further increase in price during the past week, however.

The demand for household coal continues to expand. Dealers report they are from five to six weeks behind on deliveries. Pocahontas lump is quoted at $12.34. Hard coal is coming in a little more freely. No price is quoted, the customer being billed the price at the time of delivery.

NORTHERN PANHANDLE

Since the opening of the B. & O. to Western shipments production is on a little larger scale. There is a fairly large movement to the Lakes, with the price ranging $3.25@$3.75. The demand for prepared grades is somewhat stronger. River shipments also have been increased somewhat. Buying by steel and iron mills on a large scale is also stimulating production.

DETROIT

Buyers are still looking forward expectantly to some miraculous development to provide them with coal at a lower cost. Buying is apparently being limited to orders required to provide for current consumption, while the matter of accumulating reserves is set forward.

Jobbers are of the opinion that for a few days after the closing of navigation on the Lakes there may be a more liberal supply.

Hocking lump is quoted $5.75, egg, $5.25, mine run, $3.75, nut, pea and slack, $3.25. Three-quarter lump from Pittsburgh No. 8 is offered at $4.75, mine run, $3.75, slack $3.25. Fairmount lump is $4.75, mine run, $3.50@$3.75, slack, $3.25. Kentucky and West Virginia lump is $6.50, mine run, $4, slack, $3.75@$4. Very little smokeless coal is reaching Detroit.

BUFFALO

Consumers say they are getting more coal than they need and they believe that the worst of the car shortage is over. That cars will not be in full supply for a considerable time yet is understood by everybody, but it is not now believed by the great part of the trade that anything short of a big snow blockade will cut out the supply.

The roads differ much in their car supply. Some of them are about as short as ever, while some are reported to have 100 per cent. Taken as a whole the shortage is not as menacing as it was and if it lets up much more the predictions now made that prices will go to $2.50 may be realized.

Quotations are: $5@$5.25 for gas lump, $5.25@$4.50 for steam lump; $3.50@$3.75 for mine run, with Allegheny Valley something less on account of lower freight rate; $3.25@$3.50 for slack.

COLUMBUS

With the weather rather mild and with the demand for domestic as well as steam grades somewhat saturated, there is a slight weakening in the Ohio coal trade. This is not sufficient to cause any demoralization, however, and will probably be lost at the first cold snap. Prices on certain grades have declined although prepared sizes are still at high levels.

No change has been made in prices fixed by the Ohio Fuel Administrator. The conference called in Columbus ten days ago relative to shipping Ohio-mined coal to Ohio users has not done much to relieve the situation. Retailers are buying both West Virginia and Kentucky grades and are finding a sale at rather high levels.

Steam trade is rather quiet. Reserves in many instances have been built up and users are not showing much anxiety over the future.

The Lake season is nearing its end. The trade has been fairly good although a reduced tonnage was shipped to the Northwest.

EASTERN OHIO

Operations continue at a minimum because of car shortage or transportation disability. During the week ended Nov. 4 this district produced 296,000 tons or only about 48 per cent of capacity. Cumulative figures indicate a production of 8,787,000 tons or about 35 per cent of capacity for the year.

Demand for current needs continues strong because the quantity of coal available in the open market is inadequate. Little storing is yet being done by consumers, and the majority are awaiting the close of Lake navigation. It is understood that the shipping of coal to the lower parts will be shut off Nov. 20.

Retailers are facing an active demand and are beseiging operators to furnish them with lump sizes. An announcement of unusual interest was made by the Ohio Fuel Administration allowing 50c. additional per ton above the previous maximum price on lump, effective Nov. 15, for domestic consumption. It is claimed this will have the effect of greater production in lump coal for Ohio consumers and will also curtail the shipping of Ohio mined lump to consignees outside the state who were offering and were willing to pay higher prices. Spot prices show little or no change from those quoted last week.

Bituminous coal receipts at Cleveland continue at a higher volume than at any time this year. Arrivals during the week ended Nov. 4 aggregrated 1,847 cars, divided; 1,343 cars for industries and 504 cars for retail yards. This is a decrease of 500 cars under the preceding week.

In the Lake trade the Ore & Coal Exchange figures indicate that up to Nov. 6, 14,887,644 tons have been taken by the fleet as compared with 21,254,390 tons during the same period last year.

Northwest

Apathy Continues With Northwest's Warm Weather

Hard Coal Still in Keen Demand in Face of Small Supply But No User of Soft Coal Is Worrying—Prices Stable.

Warmth still prevails throughout the region around the Upper Lakes. It seems to be sufficient to keep bituminous coal in a sluggish condition. Very little stocking is going on and trade shows a decided need for a cold snap. Coal men are fretting a little about the distributing problems that will arise with the first icy wind swooping out of the North. The only sign of life anywhere in the region is a little railroad buying down around Milwaukee.

Anthracite remains in keen demand with the supply as short as it was a week ago. Deliveries by rail are counted on to finish out the winter shortage. Some coal on rail that was tied up near the fields was reported to Fuel Distributor Spens and better deliveries have been promised. Prices generally throughout the Northwest remain stable.

DULUTH

General stiffening of the market is noticeable here this week and the anthracite market is also strong, although the increased levels quoted last week are not evident. The hard coal that was sold at an advance was some which came from mines which were outside of the general maximum price agreement and for this reason a higher price could be asked.

Official figures of shipments from the docks for October show that 18,317 cars went out. This compares with 16,178 cars in September of this year and 28,722 cars in October last year. Shipments were better than reports from separate dock operators seem to indicate throughout the month and would have been better still if more cars had been available.

Receipts for the year at Duluth-Superior harbor are placed at 3,758,687 tons which includes 3,504,188 tons of soft coal, 232,624 tons of hard coal and 21,675 tons of anthracite screenings, which have been shipped here from Fort William, Ont., for briquet manufacturing purposes. Last year to Nov. 1, 9,640,924 tons had been received, of which 7,969,084 tons was bituminous and 1,671,840 was anthracite. Receipts for October were approximately one-third of the total receipts for the season: 1,553,265 tons bituminous, 211,445 tons anthracite and 6,925 tons anthracite screenings.

One man's guess is as good as another's on the date of the closing of navigation, and whether that date is early or late depends whether there will be plenty of coal or just enough to go 'round. It is planned to lay up as many boats as possible at this port.

MINNEAPOLIS

Until there is a decided touch of cold weather, there will be no real activity in the coal movement. Consumers are still hoping for further reductions in prices. And it must be admitted that the successes which have attended their efforts thus far would seem to justify their hopes. Today steam coals of the different grades are selling at not over 50c. above the price of a year ago.

Conditions so far seem to extend a special dispensation of favor to the Northwest in the matter of fuel. Receipts of coal on the docks on Lake Superior have been about 40 per cent of those of last year, with hard coal only about 16 per cent of last year. Yet in the face of such an apparent shortage, the demand has been slack enough to force reduced prices right along on all soft coal. Hard coal is in a class by itself, when it comes to prices.

On the other hand, if cold weather shall prevail, as it may do at any time now, it would seem as though it would bring about an immediate scarcity of supply. For the retail trade has not been stocking soft coal to any extent, and has been unable to get much hard coal. The apparently sufficient stock of soft coal, seeming large in mild weather, will melt away very fast in zero days. So the problem now is wholly one of weather.

MILWAUKEE

The coal market remains quiet under continued fine weather. There is little anxiety in regard to the winter fuel supply, now that it is certain that there will be ample stock of soft coal. Anthracite is wanting, however, but dealers believe that railroads will be able to maintain a sufficient supply during the winter months. An appeal to Federal Fuel Administrator Spens released quite a number of cars bound for this market which had been stalled on sidetracks at Hazelton, Pa.

The shading in mine prices of Illinois and Indiana coal is not felt here. Only a sharp reduction of something like $1 per ton would force prices down here. Pittsburg, Hocking and Youghiogheny has been advanced 50c. per ton. Screened now sells for $10.25 wholesale and $11.75 retail. Pile run is wholesaled at $9.50. Pocahontas has also been raised 50c. per ton. Screened is now $13.75 wholesale and $15.25 retail, and mine run, $10.25@$11.75.

Cargo receipts by Lake thus far in November aggregate 41,500 tons of anthracite, and 88,738 tons of soft coal. If good weather prevails during the rest of the Lake period, the supply of both hard and soft coal will be greatly augmented.

New England

Little Change in Market; Inquiry Light and Scattered

Prices Show Tendency to Firmness—Large Plants Still Disinclined to Buy—Demand Uninfluenced by Car-Shortage Reports—Improvement Unlikely This Month.

The market shows no material change. Occasionally there are reports of better demand, but inquiry is still light and scattering. Both at the rehandling wharves and all-rail there is a slight firmness in price, but there has not yet been realized any price that would show more than a small advance over the market level of a week ago. The large corporations are still in comfortable position as to reserves and apparently there is no inclination to buy for the present.

Central Pennsylvania shippers are trying to impress upon regular customers the advantage of making purchases at present prices, but the most alarming reports of car shortage seem to have little influence upon current demand. The territory easily accessible to Tidewater is loaded up with British as well as Southern coals.

At Norfolk and Newport News there are still tonnages available far in excess of bottoms waiting, and while accumulations shift up and down from day to day there is still ample Navy standard coal offering at prices not much in excess of $7. Heavy movement West is followed almost regularly by embargoes that throw the bulk of current mining to Tidewater and the smokeless agencies are by no means relaxing their efforts to place coal in New England.

At the Philadelphia and New York piers there is still very little business on steam grades. Operators who are hardy enough to send coal down in the hope of making spot sales are almost uniformly disappointed and find themselves obliged to sacrifice.

Among retail distributors of anthracite there is developing a limited demand for screened bituminous of good grade, but in no section thus far is there any special interest in substitutes for hard coal. Not yet are consumers here convinced that they must take a leaf out of the Western book and use prepared sizes of bituminous. It is quite possible, however, that colder weather may have its influence on the market for these sizes.

Cincinnati Gateway

Bulk of Recent Activity Consists of Lake Business

Movement Improves Steadily—Domestic Buying of High-Volatile Coals an Encouraging Market Factor—Demand for Railway Fuel Quickens — Public Institutions Active.

Lake business handled through the Cincinnati coal offices has been closing with a rush, this forming the bulk of the activity here last week. The movement has been steadily improving and with the N. & W. placing its titanic cars in this trade the movement off that line has been accelerated. Domestic buying of high-volatile coals has been another bright spot, while the other points of activity have dropped down to a steady grind.

Demand for railway fuel has been picking up and some large buying orders are in sight for lines north of the Ohio River. Steel mill business is not so active and industrial plants have been less urgent in pressing their needs. Michigan and northern Ohio public institutions have been in the market stronger than for some time past.

HIGH-VOLATILE FIELDS

Kanawha

With the Western embargo lifted, mines in the Kanawha field are beginning to recover from the slump. Although it has been possible to increase production somewhat, it is still not much over 25 per cent owing to car shortage. There is a market for all the coal the field can produce, now that it is no longer necessary to ship the entire product of the region to the East.

Logan & Thacker

Logan mines have also been able to increase production slightly. Opening of Western markets stimulated the demand somewhat for Logan coal which had been diverted to the East for a time. Owing to the fact that production is so limited there is really little spot coal to be had.

Production in the Kenova-Thacker field is not fluctuating to any great extent. More coal is being produced proportionately in this district, however, than in other high-volatile fields owing to the fact that the N. & W. is somewhat better able to handle loads.

Northeastern Kentucky

Despite the effort of the general run of buyers to remain out of the market and "bear" prices, there is still a fairly brisk demand and little chance of prices declining any further. Much coal is going to the Lakes and some is also being marketed in Ohio.

CINCINNATI

With the Tidewater prices a shade better than they have been for some weeks past the N. & W. producers were inclined to look more keenly in that direction than to the Inland trade. Smokeless business, both from the Pocahontas and the New River districts, was holding around the $6 basis that had been established by Commissioner Spens, but the deliveries except to the Lakes were not as large as they might be.

Car reports at Cincinnati show that 1,682 less cars than the week previous had been sent back to the mines. Motive power on the C. & O. as well as on the L. & N. is in ticklish shape and the first flurry of winter is liable to spell an upturn to the prices. Southeastern Kentucky shows a slight increase in production with some mines working full two days a week. Logan County is offering more coal here than for some time past. This increase with other conditions has softened the market 25c. a ton in the past week.

Retailers found their prices cut 50c. this week by one independent company. Some of the others are holding to the old prices of the low level as follows: Smokeless lump, $10.50, run of mine, $8.75; splint lump, $10; slack, $7.50.

LOW-VOLATILE FIELDS

New River and The Gulf

New River producers are not making any progress in increasing their output owing to limited car supply, while better transportation conditions are still far from satisfactory. Inasmuch as the Western embargo was lifted about the first of the month, the region has a somewhat broader market. Mine run in the West has been bringing nearly as much as prepared grades in view of the price agreed upon for the latter. There is not a strong demand in the East.

In the Gulf region there has been a slight increase in production, which is now averaging a little over 100,000 tons a week, owing to improvement in transportation facilities. Virtually none of the coal is finding its way to Western markets. Although Tidewater demand is not active, nevertheless producers are finding a ready market for all the coal it is possible to produce.

Pocahontas and Tug River

Pocahontas production is on a somewhat lower level, a total of 231,000 tons only being the average within the last week or two. As only certain classes of equipment can be moved to Western markets, that is preventing mines from securing all the empties needed. The flow to Eastern markets is much larger than to points west of the Ohio River, notwithstanding the fact that there is a great disparity in the prices prevailing in the East and in the West.

Few Tug River mines are working more than two days during a week. Virtually all the product of this region, such as it is, is being marketed in Western points, with a fairly large volume moving to the Lakes.

Coke

UNIONTOWN

After having been in force for one day, an I. C. C. order directing 50 per cent of mine rating be shipped to the Great Lakes, the order was canceled as suddenly as it was issued. The ruling was made on Nov. 6 but did not get to railroads operating in the Connellsville region until Nov. 9.

The order was designed to get as much coal to the Northwest as possible before the Lakes closed, but operators here did not see the necessity of a mandatory order. They had found the Lakes trade a profitable market at a time when coal is not easy to sell and did not need a compulsory order.

Fairly large orders for railroad coal were placed this week but they in no way strengthened the market, which continues quotable at $3 for steam coal and $3.50 for byproduct. The car supply showed some improvement.

The coke situation is drawing most attention today because of the nearness of the furnace contracting period. The increased production is absorbed by the trade, but prices have not yet been stabilized.

CONNELLSVILLE

The coke market has experienced a sudden drop, practically overnight, about 50c. in furnace coke and $2 in foundry coke, the decline in foundry being chiefly by way of the unusually large spread over furnace coke being diminished.

At the same time that furnace coke prices declined a new alignment developed. Previously, the cheapest coke was spot coke, this being coke loaded and on railroad company track. It could be had at $7.50, while coke for regular shipment over a week or two commanded fully $8. There does not seem to be any distress coke now, yet coke for spot shipment is held at $7.25 @$7.50, while coke for shipment in a few days can be had at $7@$7.25. Foundry coke is now $8@$9, depending on brand.

Demand is rather light. Nearly all the furnaces now in blast that are dependent on purchased coke seem to be covered fairly well to the end of the year. Some Eastern blast furnaces, now idle, are understood to have intimated that $6 would interest them, on the basis that they need to make pig iron at lower cost in order to make it salable. Operators, however, talk of weather troubles next month being likely to advance the market.

The *Courier* reports production during the week ended Nov. 4 at 105,350 tons by the furnace ovens and 58,970 tons by the merchant ovens, a total of 164,320 tons, an increase of 4,540 tons.

BUFFALO

Attention is turned mostly to the domestic supply. Prices have dropped steadily of late, being $8.50@$9 for 72-hr. Connellsville foundry, $7.50@$8 for 48-hr. furnace and $6.50@$7 for off-grades, adding $3.28 for freight. Some of the local byproduct ovens are selling sizes for domestic use at $12.

News Items From Field and Trade

ALABAMA

C. S. Ramsay, superintendent of the Dora division of the Pratt Consolidated Coal Co., comprising the Nos. 10 and 12 openings and the Clipper Mine, has resigned and will move to Sanford, N. C., where he has accepted a position as vice-president and general manager of the **Erskine Ramsay Coal Co. John Terry**, mine foreman at No. 10 mine has also resigned and it is understood will be superintendent of the new operations of the Ramsay company. **John B. Davidson** has been appointed to succeed Mr. Ramsey.

One of the biggest coal mines in Alabama has been opened in Bibb County by the **Moffatt Coal Co.** of St. Louis. It is the Dixie mine, which is producing between 200 and 300 tons a day and probably will reach 800 tons when it is fully developed. It is a slope mine with three passageways on the main slope at an angle of 45 degrees. One way is for men, one for air and the third for haulage. This is the first venture of the Moffatt Coal Co. into the South.

CONNECTICUT

The Kimberly Coal Co., Inc., of New Haven, has been incorporated under the laws of Connecticut, to carry on a general coal business in that city. The firm will have a capital stock of $50,000. The incorporators are: Michael and Benjamin Krall, and Abraham Shalit, all of New Haven.

ILLINOIS

The Harrisburg Consolidated Coal Co., Chicago, has been incorporated to mine and deal in coal by Thomas H. Cochran, William J. Brennan and C. W. Paltzer.

The Chicago, Wilmington & Franklin Coal Co. announces the reopening of its Mine B, located near Herrin. The mine has been idle since Oct. 8, 1921.

Plans to make the Big Muddy River navigable to the Mississippi, making possible the loading of Franklin County coal on barges to be towed to the Mississippi, are being considered. Such a move would do much to relieve the car shortage and would permit delivering of coal in Chicago and other points at $1 a ton cheaper than at present, it is believed. **William Sackett, state superintendent of waterways**, says such a survey has been completed and that a report will be submitted to the next legislature with the recommendations for undertaking the work. This is reported to be one of the reasons why the **Central Illinois Power Co.** decided to locate its station at Grand Tower on the Mississippi, where large and small coal barges can be handled.

Candidates for offices in the Illinois U. M. W., who will be voted on in a statewide election Dec. 12, have been named on completion by tellers of the recent nomination returns. A report of the findings has been mailed to each of the 350 local unions. The voting will be under the Australian ballot. Ninety-five thousand miners are expected to participate. Interest in the election centers around the race for president. **Frank Farrington**, the present incumbent, received a total of 131 nominations against a total of 151 for **John Hindmarsh** of Riverton, and a hot battle is predicted. Supporters of both Farrington and Hindmarsh are claiming victory.

Rapid progress is being made at the works of the new **Rex Mining Co.**, located four miles northeast of Orion. A large cement block engine house is already completed. The location has been thoroughly tested by numerous drillings and while good coal was found at a lesser depth the roofing rock was missing, and the company will go to a depth of 176 ft. where a seven-foot vein with good rock roofing is to be found.

Incorporation papers have been filed at Belleville for the **Red Ring Coal & Mining Co.** with main offices at East St. Louis, Ill. The capital stock of the company is given as $150,000 and the incorporators are Elmer H. Wright, A. W. Seigiaff, Michael T. Wright and J. A. Knebel of St. Louis and East St. Louis.

W. L. Walton of Chicago was in Williamson County mining fields recently visiting various mines near Marion. He is connected with the Lake & Export Coal Sales Corporation and on his return trip, visited the St. Louis offices of the company.

INDIANA

The Conveyors Corporation of America, Chicago, has appointed the **Geo. W. Fife Engineering Co.**, Indianapolis, its representative for the sale of American trolley carrier in the state.

Mayor John M. Grayson, of Vincennes, has announced he will **open a municipal coal yard.** Indiana mine run will be delivered in the basements of the domestic consumers at $5 a ton. Coal is to be procured from one of the largest mines in Knox County. Coal will not be sold in less than ton lots and must be paid for on delivery. Mine run is retailing there at $6 a ton. Members of the Vincennes Retail Coal Dealers' Association have protested against the opening of the yard.

The Peerless Coal Co., an Illinois corporation, has qualified to do business in Indiana. E. J. Suffel, of Indianapolis, has been named state agent.

Resolutions directed toward the **elimination of profiteering in coal through regulation of the assigning and distributing of cars at the mines**, were passed at a recent meeting of the directors of the Indiana State Chamber of Commerce. The need for the regulation of car distribution by federal and state boards was brought to the attention of the organization by its president. Copies of the resolution have been sent to the committee recently named by President Harding for investigation of the coal industry, as well as to the Public Service Commission of Indiana and all members and member bodies of the Indiana State Chamber of Commerce, representing more than 20,000 firms and individuals in the state.

The Jasonville Fourth Vein Coal Co., of Jasonville, and the **Busram Creek Coal Co.**, of Terre Haute, have filed final certificates of dissolution, while the **Bicknell Coal Sales Co.**, Indianapolis, has filed a preliminary certificate of dissolution with the secretary of state.

MARYLAND

Cumberland capitalists have organized the **Helen Coal Mining Co.**, the offices of which will be at Cumberland. This company has an authorized capital stock of $50,000. Chiefly interested in the new enterprise are: Robert Grant, Sr., John F. Somerville, M. H. Grant, H. M. O'Brien and W. R. Nethken, all of Cumberland.

MICHIGAN

And now Michigan enters the Ohio Fuel controversy. The Michigan fuel administrator has written to the Washington fuel authorities protesting against any federal order which will hold Ohio coal within that state, thereby preventing its normal flow into Michigan. The Ohio official's plan proposed a preferential treatment in the distribution of coal within Ohio zones to those nearest the Ohio mine operators with priority on cars for such shipments of coal and a bar against reconsignment of cars given such priority.

As a means of providing anthracite for some of the smaller communities of the state which have been unable to obtain shipments, the Michigan fuel administrator is recommending to the state administrative board that **purchase of a supply be made by the state**, under authority conferred by the fuel control law, payment to be made from the $500,000 revolving fund created by the act for fuel purposes. The anthracite after being delivered in the state would be reconsigned by the fuel administrator to dealers in towns that have been unable to get anthracite.

In checking over the applications received for licenses under the state's new fuel control act, **Charles F. Dunn**, fuel administrator for Wayne County, is making careful investigation of several applicants, who reported they had been in business about three weeks. His purpose is to guard against "snowbird" dealers taking advantage of the law.

NEW YORK

The newly organized **Morrow Callahan Coal Co.**, of Pittsburg, has opened an office at 1 Broadway, New York City, which will be headquarters for its pulp and paper mill department. **J. Floyd Massey** is manager of the department and others interested are **E. C. Woodruff** and **Wm. A. White.**

Victor T. Goggin and James H. Ripley, formerly contracting engineers of Dwight P. Robinson & Co., Inc., have formed under the name of **Goggin and Ripley, Inc.**, with headquarters at 350 Madison Ave., New York, a personal service corporation to assist business executives, bankers and engineers in conceiving, financing and developing construction projects.

The Simplex Wire & Cable Co., of Boston, has established a branch office in New York at 120 West 32nd St., with Joseph G. Brobeck as manager.

Before owners of buildings in New York City are permitted to **substitute fuel oil burning equipment for coal burners** they must conform to the stringent rules of the Fire Department and the Board of Standards and Appeals. So far fifty buildings have conformed to the rules and have been granted permits to substitute oil for coal. As many more applications are now in the hands of the authorities for action and some of the buildings are already equipped with the necessary apparatus awaiting action on the permits.

The twenty-fifth anniversary meeting of The Merchants' Association of New York, will be held in Madison Square Garden on the evening of Friday, Nov. 17.

The sixth annual industrial conference of the State of New York will be held in Buffalo, Nov. 21, 22 and 23, at the Lafayette Hotel. The central theme for the conference is to be **elimination of waste in industry.**

OHIO

Administrator Neal has secured the removal of priorities on West Virginia, Kentucky and Pennsylvania lump destined for Lake shipment. It was believed that the priorities would serve to further curtail the supply of coal cars in Ohio and would serve no beneficial purpose.

The Columbus municipal coal yard announces that no deliveries of coal will be made before Nov. 20, as all teams and apparatus are necessary for the street cleaning work previous to that date. Practically no coal is on hand at this time.

The Pfau Coal Co., Bolivar, has been chartered with a capital of $20,000 to mine and sell coal by C. J. Pfau, Hermine E. Pfau, William Daley, J. O. Peoples and H. L. Pfau.

The Speaks-Drais Coal Co., Columbus, chartered several weeks ago with a capital of $10,000, has taken over the retail coal business formerly operated under the name of the **S. S. Speaks Coal Co.** S. S. Speaks is president and Charles W. Drais, secretary and treasurer.

Ohio Administrator Neal is having an **extensive study of retail costs** in some of the larger cities in the state with a view of revising the list of retail margins allowed. Protests were made by retailers in Toledo, Cleveland, Columbus, Youngstown and Dayton. Expert accountants have been put on the books of certain retailers in the cities named and a new list will be announced as soon as the work is completed.

The complaint brought by the **Ohio Mining Co.**, and twenty-two other operators in the Hocking Valley field against the **Hocking Power Co., the Athens Electric Co. and the Southern Ohio Power Co.**, protesting rates charged for electrical power at their mines which has been pending in the Ohio Utilities Commission is still undecided but the commission has ruled that the last named concern was not a public utility and thus could not be brought within the jurisdiction of the commission. On this question the operators interested carried the case to the Ohio Supreme Court for a decision on that question. The Ohio Utilities Commission is still investigating the reasonableness of the rate and to that end has ordered an inventory of the assets of the two electrical companies.

The Lake Superior Coal Co., Cleveland, has been incorporated with a capital of $10,000 to mine and sell coal in Pittsburgh No. 8 field. Incorporators are W. F. Maurer, T. B. Bolton, Norton McGriffin, John F. Wilson and E. R. Donlin.

The Salisbury Coal & Clay Co., Cleveland, has been incorporated with a capital of $400,000 to mine and sell coal as well as operate clay mines. The incorporators are: Joseph F. Rumsey, B. O. Young, Thomas H. Moore, Bess Allen and P. A. Berry.

Members of the Middletown city commission have decided not to establish a municipal coal yard owing to the uncertainties of the coal business and the expense necessary for such a venture. City Manager Kenyon Riddle had proposed the establishment of such a yard.

The stripping operation of the **Piney Fork Coal Co.**, at Piney Fork, Jefferson County, is now going full blast. **The Panhandle Collieries Co.**, another one of the **Hisylvania Coal Co.**, interests is also being operated and a good output is reported. The latter operation is comparatively new.

W. D. McKinney, secretary of the Southern Ohio Coal Exchange, is out with a statement to the effect that transportation difficulties are the handicap which is keeping the production of coal in all Ohio fields to a low point. He claims that this is partly due at least to the use of coal carrying equipment for other purposes other than the transportation of coal and asks everyone to keep an eye on the illegal use of coal cars.

The Caledonian Coal Co., has been chartered with an authorized capital of $50,000 to take over the Caledonian mine near New Lexington which has been operated as a partnership. The incorporators are James Williamson, George Williamson, E. M. Blower, Charles Wallace and John Williamson. Headquarters are in Columbus.

OKLAHOMA

D. K. Hutchcraft, formerly vice-president of the Indiana Air Pump Co. has been appointed district manager of the Chicago Pneumatic Tool Co.'s branch office recently established at Tulsa.

R. J. Danford, president of the **Walker Coal Co.**, is still occupied with the installation of electrical equipment in that company's two shaft mines near Vinito. These operations are at the extreme southwest corner of the big coal field. There is much development at that end of the field and the new coal mining town Banzet is doing a thriving business.

The Warden-Pullen Coal Co. is making its first shipment of coal from its new No. 2 mine, opened earlier in the year. Its No. 1 mine continues to put out its capacity, and it is reported that the mines in the Henryetta district, about 54 in all, are working full force.

PENNSYLVANIA

Four men lost their lives and four others were injured, one perhaps fatally, when a charge of dynamite, fired in some unknown manner hurled tons of rock upon them, in the Birdseye slope of the Olyphant mine of the **Hudson Coal Co.** on the mountainside beyond Throop last week.

The Pennsylvania State Employment Bureau estimates that at the beginning of November there was a common labor shortage of 25,000 to 35,000. The most serious shortage is in the Pittsburgh district. The bureau gives as the number of unemployed at the present time 37,880, while the number of persons out of employment because of strikes is 92,273. The coal strike in the Pittsburgh district, the employment bureau states, is responsible for 80,000 persons being out of work.

The Pennsylvania State Forestry Commission is distributing 4,000,000 trees for re-forestration purposes and the coal companies and water companies of the state lead in the number of trees allotted. The coal companies are planting additional land for the purpose of growing mine props and the water companies are planting trees for protection of their water sheds.

The Pine Hill Collieries Co. has notified the State Department at Harrisburg of an increase in capital stock from $5,600 to $3,000,000. Edwin S. Dixon, Jr., Philadelphia, is president of the company.

Fifteen hundred miners employed at the No. 14 colliery, **Pennsylvania Coal Co.**, near Pittston, went on strike last week when forty-seven carpenters employed at the colliery refused to join the union or pay their "two days' pay assessment," which was ordered during the five months' suspension. Company officials contend that the carpenters are members of the carpenters' union and do not come under the jurisdiction of the U. M. W. The leaders of the miners express a different view, however, and say that all men working in or around the collieries are qualified and should belong to the union.

Investigators of coal deposits in Lancaster County are being made by mining experts for the purpose of determining the possible commercial value of the product. A survey of the hills in which small deposits have been found at various times was made recently by representatives of the federal and state mine departments.

The Bertha Coal Co. recently acquired one hundred new seventy-ton steel hopper cars from the Ralston Steel Car Co., which have been placed in service between its Bertha Mine, Dinsmore, and the various plants of the General Motors Corporation in and around Detroit, Motors Corporation having arranged for a long-term fuel contract with the Bertha company.

Coal mining companies in Cambria County have filed appeals with the county commissioners from the tri-ennial assessment on the grounds that the real estate was not assessed at the actual value thereof, being assessed without due regard to the valuation and assessment made of other similar properties in the country, but was assessed in excess of the value and assessment of such other properties. The following companies filed appeals: Holding of the **Wilmore Coal Co.**, Richland and Adams townships and Scalp Level borough and Conemaugh, Croyle and Stonycreek townships; **Berwind-White Coal Co.**, Richland and Adams townships and Scalp Level borough; **Maryland Coal Co.**, Richland, Croyle and Adams townships.

The general offices of the **Mon-Scott Fuel Co.** will hereafter be located in Pittsburgh. Offices have been established in the First National Bank Bldg. The Pittsburgh office will be in charge of W. H. Davis. The company will keep its offices in Morgantown, W. Va., for use as a branch and selling agency. Through the Pittsburgh office the products of the **Hess Coal & Coke Co., Shamrock Fuel Co., Bear Mountain Gas Coal Co.** and the **Winstead Coal Co.** will be handled. General offices of the company have been located at Morgantown since the company was formed about three years ago.

Citizens of the Borough of Taylor have requested Attorney General George E. Alter to suspend the provisions of the Kohler mine cave law so as to insure full time coal mining operations by mines at that town. **The Glen Alden mines** are the principal source of employment for the community. The company was ordered to suspend operation a year ago when its operations threatened a portion of Scranton and the Taylor citizens say the company will not begin at Taylor until assured of the suspension of the mine cave law. The Attorney General has no power to suspend laws.

Raymond K. Bowden, of Niles, Ohio, has been appointed instructor in metallurgy, for 1922-23, at Carnegie Institute of Technology, Pittsburgh. The Department of Metallurgy at Carnegie Tech was recently selected by the United States Naval Academy as its graduate school of metallurgy. Beginning this year, two officers from the Naval Academy have been assigned to take up advanced work in metallurgical subjects at the Pittsburgh institution.

A decision of importance to the shovel trade was recently rendered by the Circuit Court of Appeals for the Third Circuit in the case of **John S. Surbaugh and Pittsburgh Shovel Co. vs. Hubbard & Co.**, No. 2838, March term, 1922. The opinion found the Surbaugh patent in suit No. 1,212,582 to be valid and infringed as to all claims in suit. The litigation is conclusive as to the validity of the patent. Under the decision the manufacture and sale of these two and three prong shovels is controlled by **The** Pittsburgh Shovel Co.

VIRGINIA

The Willard Sutherland Corporation, after announcing the closing of its Norfolk office Nov. 1, has reconsidered and decided to continue its business here under the management of **Chester B. Koontz.**

WEST VIRGINIA

There were 116 applicants for certificates as mine foremen and fire bosses when the annual examination was held recently at Logan, under the direction of R. M. Lambie, Chief of the West Virginia Department of Mines, assisted by Inspector J. F. White and four other district mine inspectors. The examination covered a wide range of subjects and was said in every way to have been a practical one. Examinations have also been held in other sections of the state from time to time during the summer.

Ushered into existence a few weeks ago, the **Beahler Coal Co.** has secured 225 acres of coal land adjacent to Indian Creek in the Monongalia County field and is planning to develop the tract so acquired at the earliest time practicable.

It is reported in coal circles in the Pocahontas region that **Henry Ford** has purchased the **Twin Branch property** of the **Dex-Car Pocahontas Coal Co.** and has already taken over the control of the property so purchased. It will be recalled that Mr. Ford recently abandoned the operation of mines at Nuttallburg because he found they could not be successfully operated in competition with other mines in the same section. It has been understood for several weeks that Mr. Ford has been negotiating for the purchase of one of the largest undeveloped tracts in the Pocahontas area. This tract is in Tazewell County, Va.

The Midland Smokeless Coal Co. is the name of a new concern launched with a view to operating in the Greenbrier smokeless field, this company being capitalized at $50,000. Headquarters are to be at Ronceverte. Leading figures in the new company are: L. E. McClung, B. M. Higginbotham, of Rupert; Guy B. Montgomery and C. H. Thompson of Ronceverte; Ernest Echols of Glasbow, Va.

Organization of the **Clay County Coal Co.** with a capital stock of $100,000 presages the development of coal land in Clay County on a fairly large scale. Huntington people, for the most part, are interested in this company, but its general office will be at Clay. Interested in this concern are: A. D. Callihan, J. Frank Grimet, Morris Hansford, of Huntington; B. L. Noe and C. A. Parcell, of Clay.

Charleston capitalists have organized the **Alpine Coal Co.**, with a view to operating on a fairly large scale in southern West Virginia high-volatile territory. Headquarters are to be at Charleston. Actively identified with the new company are: W. E. Wright, E. L. Michie, S. G. Smith, Duke W. Hill and Arthur B. Hodges, all of Charleston.

Further development of coal property in the Williamson field is presaged by the organization of the **Waugh-Longley Coal Co.**, headquarters of which will be at Williamson. This company has a capital stock of $10,000 and interested in it are: C. S. Waugh, M. E. Waugh, R. O. Halsey, Jr., all of Williamson; F. L. Longley and Iris Longley, of Bluefield.

The Talisman Coal Co. is the latest to enter the Monongalia field, this company just having been organized with a capital stock of $10,000. Offices are to be at Morgantown. Identified with the new enterprise are: Robert L. Brock, John A. Wade, John H. Gross, Charles G. Baker and S. S. Wade, all of Morgantown.

The Brown Coal Co. of Uniontown has purchased from **Cole Brothers**, of Morgantown, 104 acres of Pittsburgh coal in the Bar Mountain section of Barbour County, the purchase price of $100,000 being paid in cash, it is said. The Bear Mountain section has only been in the course of development during the last year or two and is still to a great extent a virgin field. The purchasers are making preparations to drive an opening immediately and to erect a modern plant on the property. Cole Brothers were the contractors who built a line of railroad, about seven miles, from the Bear Mountain field to the Astor branch of the B. & O., which serves the Simpson Creek field.

Having sold bonds to the amount of $350,000 to the Union Trust Co., of Cleveland, the **Fairmont & Cleveland Coal Co.** will not only extend its business but will enlarge the Chesapeake plant at Barrackville, recently purchased from the Chesapeake Coal Co. by the Fairmont-Chicago Coal Co. The Parker Run mine has a capacity of 3,000 tons a day. It is hoped to increase the capacity of the Chesapeake mine to 2,000 tons a day.

CANADA

The Scotia coal production in October is considered fair despite the unfortunate circumstances, that the Jubille and No. 7 were idle a few days. At present about 16,000 tons remains in the heap at Princess and the railway department expect to dispose of this amount during the present month.

What promises to be a **coal mine of some importance** is one being developed by **Joseph Walters**, a few miles distant from the town of Merritt, B. C. Contemplated developments include a slope to be driven on the full pitch of the seam to the dip, when this slope has been developed, a haulage tunnel will be driven in at a lower level, where the coal can be easily handled to the Kettle Valley Ry. which passes a short distance from the property. The new mine is known as the **Normandale Mine.**

WASHINGTON, D. C.

The future extensive development of a substantial coal-mining industry in the **public land areas of certain Western states** is forecast in statistics compiled by the Federal Bureau of Mines which show that up to Oct. 1, the Bureau had issued 263 permits for prospecting for coal on government lands, 42 leases for commercial coal operations on these lands, and 5 licenses for production of coal limited to personal use. The total minimum annual production of coal required in the issuance of these various authorizations is 1,586,550 tons. The total investment to be expended on leases amounts to $2,453,550. A total of 228,224 acres of the public domain is covered by permits for coal prospecting issued by the Bureau; for coal leases, 26,910 acres are covered, and for coal licenses, 220 acres.

One hundred per cent of the **byproduct coke production** of the country is covered in the **reports being furnished the U. S. Geological Survey.** All producing companies are making monthly returns. The Survey's record of the monthly output of byproduct coke is complete for 1917 and 1918 and for 1921 and 1922, but the figures were not compiled during 1919 and 1920. In order to fill that gap in the statistical record of the industry, schedules have been sent by the Geological Survey to the producing companies, on which they are asked to submit the production figures for those years.

Sales of explosives during September totaled 814,675 kegs of black blasting powder, 4,900,697 pounds of permissibles, and 17,728,989 pounds of other high explosives, according to manufacturers' reports to the Bureau of Mines. As compared with the preceding month, sales of black powder increased 35 per cent, permissibles increased 49 per cent, and other high explosives decreased 2 per cent. The increased sales of black powder and permissibles were due to greater activity in coal mining; in fact, the coal mining industry not only used more powder and permissibles but also more dynamite and other high explosives in September than in August.

A little **booklet entitled "War Surplus,"** has been issued by the sales promotion section of the office of the director of sales, of the War Department. This booklet describes in a general way the methods of sale resorted to by the War Department in the disposal of its vast stocks of surplus property, and tells what these stocks contain. A loose leaf insert lists the more important sales scheduled for the near future, with information as to where the sale is to be held.

Fact-finding with regard to wages and earnings of mine workers will be done by **Prof. Joseph S. Willitts,** of the University of Pennsylvania for the President's coal commission. Prof. Willitts is an economist of established reputation, who has done successful work in connection with wage scales. Since the Commission has committed itself to await suggestions from the various branches of the coal business before formulating its own plan of action, no great amount of progress has been made during the past week in the formulation of its plans. The week has been spent, however, in informal conferences and consideration of the data which its staff already is laying before it. A plan is being worked out whereby all material submitted by outside sources will be carefully checked so that the commission will be in a position to underwrite any of the facts and figures which it may care to use.

Tests conducted at the experimental mine of the Bureau of Mines at Bruceton, Pa., hold out the hope that wireless waves may be used in the future as **a means of effective communication** between rescuers on the surface and miners entombed in mines following fires and explosions. These preliminary experiments of the bureau, made in co-operation with the Westinghouse Electric & Manufacturing Co., while failing to develop any practical method of using wireless waves for underground communication, nevertheless indicate clearly that electromagnetic waves may be made to travel through solid strata. In the Bruceton experiments, signals were heard distinctly through 50 ft. of coal strata, although the audibility fell off rapidly as this distance was increased. The absorption or loss of intensity with distance is very great for the short wave lengths used in these tests. Details of these experiments are given in Serial 2407, "Experiments in underground signalling with radio sets," copies of which may be obtained from the Bureau of Mines, Washington.

Federal Fuel Control Notes

The fifteen naval officers, designated to act as field representatives of the Federal Fuel Distributor in as many districts into which the territory east of the Mississippi River has been divided for administrative purposes in connection with the present coal emergency, have resumed their duties at their respective posts, following a conference with Federal Fuel Distributor Spens in Washington, Nov. 4. The car supply situation remains a troublous problem, various Southern railroads complaining particularly regarding the **failure of connecting lines to return coal-carrying equipment.** This particular situation, however, seemed to be improving. Use of some open-top equipment for the transportation of stone, sand and other building material was reported, and it was stated that this diversion of coal cars was being investigated by the Federal Fuel Distributor. Individual priorities for the movement of coal have been almost entirely eliminated. The co-operation of coal operators with the administration's field representatives was being obtained quite generally in the various fields, it was said. **Conferences on the matter of prices** will probably be held by the Federal Fuel Distributor in Washington within the next few days with representatives of the operators from the Ohio, Indiana, Illinois and western Kentucky fields and the Kanawha and Logan fields of West Virginia.

Operators from the Kanawha field discussed the price situation with theFederal Fuel Distributor on Nov. 13. The operators expressed a unanimous desire to reduce prices, but declared it would be impossible while their costs are being increased by a car supply which makes possible only one day's operation per week.

Publications Received

Analyses of Mine and Car Samples of Coal Collected in the Fiscal Years 1916 to 1919, by A. C. Fieldner, W. A. Selvig and J. W. Paul, Bureau of Mines, Washington, D. C. Bulletin 193. Pp. 391; 6 x 9 in.; tables

Corrosion Under Oil Films, With Special Reference to the Cause and Prevention of the After-Corrosion of Firearms, by Wilbert J. Huff, Bureau of Mines, Washington, D. C. Technical Paper 188. Pp. 25, 6 x 9 in., illustrated.

Information regarding conditions, removals and changes in the **permissible list of explosives** from March 15, to Sept. 30, 1922, is given in **Serial 2402,** by S. P. Howell, explosives engineer, **just issued by the United States Bureau of Mines.** The list supplements the complete list of permissible explosives tested to March 15, 1922, which was published in Technical Paper 307. A permissible explosive is an explosive which is similar in all respects to the sample which has passed certain tests prescribed by the Bureau of Mines to determine its safety for use in gaseous dusty coal mines, and when used in accordance with the conditions prescribed by the bureau. While permissible explosives are designed especially for use in gaseous and dusty coal mines, they are suitable for use in other coal mines and for many other blasting operations. Serial 2402 may be obtained from the Bureau of Mines, Washington.

The issuance of Bulletin 167, **Coal-dust explosion tests in the experimental mine 1913 to 1918,** by George S. Rice, L. M. Jones, W. L. Egy and H. P. Greenwald, is announced by the United States Bureau of Mines. This bulletin describes the second series of coal-dust explosion tests conducted by the Bureau of Mines in its experimental mine. It covers a period of more or less consecutive testing, during which many important conclusions were drawn regarding the way a coal-dust explosion may originate, the mechanism of an explosion, and the methods of preventing explosions and of limiting incipient explosions.

Owing to the expense involved in publication, the entire distribution has been entrusted to the Superintendent of Documents, Washington, D. C., who sells the report at a price of $1.

Traffic News

Not only is the sale of the **Morgantown & Wheeling,** a short coal-carrying road in Monongalia County opposed, but a special judge in the county court has entered an order calling upon **Samuel Pursglove,** well-known coal man and receiver of the road, to secure the stock certificates of the **Monongahela & Ohio,** which are said to be in the possession of the **People's Natural Gas Co.** These stock certificates are said to be the property of the Morgantown & Wheeling stockholders. It is contended that the stock certificates were never issued by the gas company, although voted by that company in electing directors and in voting a mortgage of $119,000. Counsel for the M. & W. claim that this was unlawful and illegal. Sale of the road is opposed on the ground that when the road became insolvent and was taken over by a receiver, its valuation was not in excess of $400,000, but that owing to the development of the Scott's Run field the road now has a value of approximately $1,500,000.

The I. C. C. refused to authorize the **West Virginia Northern Ry. Co.,** owned by J. H. Weaver, to take over two small branch lines, one owned by Weaver and the other by the Carleton Mining & Power Co., on the ground that the West Virginia Northern's operation up to this time had not justified its existence as a railroad and because no public interest demanded the acquisition of two pieces of track, less than two miles long, one at a cost of $91,000 and the other at a cost of $32,000.

A party of Virginian Railway officials and **members of the board of directors** visited the Winding Gulf Field of West Virginia about the middle of November and held an extended conference with President E. E. White of the Winding Gulf Operators' Association. The potentialities of the Virginian territory were fully gone into and it was clearly shown in the conference that the coal tonnage in the section traversed by this railroad had been barely scratched. There is a feeling among operators that in the near future further appropriations covering the purchase of additional equipment for the needs of the Virginian will be forthcoming.

Association Activities

Northern West Virginia Coal Operators' Association

Representatives of the association held a conference with transportation officials of the Baltimore & Ohio late in October with a view to securing some relief from the situation, under which coal originating in northern West Virginia fields is debarred from Western shipments owing to embargoes. Operators called attention of the B. & O. officials to the fact that coal originating in Ohio was being permitted to go forward to the Lakes at a time when West Virginia coal was being debarred and it was inferred that the embargoes under such conditions were to be regarded only as discrimination. The railroad is said to have taken the position that more business can be handled from the Ohio mines than from West Virginia mines in a given length of time and therefore the shorter haul is to be preferred as a matter of dollars and cents, and officials of the railroad are said to have frankly stated that to representatives of the association.

Coming Meetings

The Illinois Mining Institute will hold its next meeting Dec. 1 and 2 at the Illinois Union Bldg., cor. Wright and John St., Champaign, Ill. Secretary, Martin Bolt, Springfield, Ill.

West Virginia Coal Mining Institute's annual meeting will be held Dec. 5 and 6, at Huntington, W. Va. Secretary, **R. E.** Sherwood, Kanawha Bank Bldg., Charleston, W. Va.

Coal Mining Institute of America will meet Dec. 13, 14 and 15 at Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 911 Chamber of Commerce Bldg., Pittsburgh, Pa.

National Exposition of Power and Mechanical Engineering will be held at the Grand Central Palace, New York City, Dec. 7-13. Manager, Charles F. Roth, Grand Central Palace, New York City.